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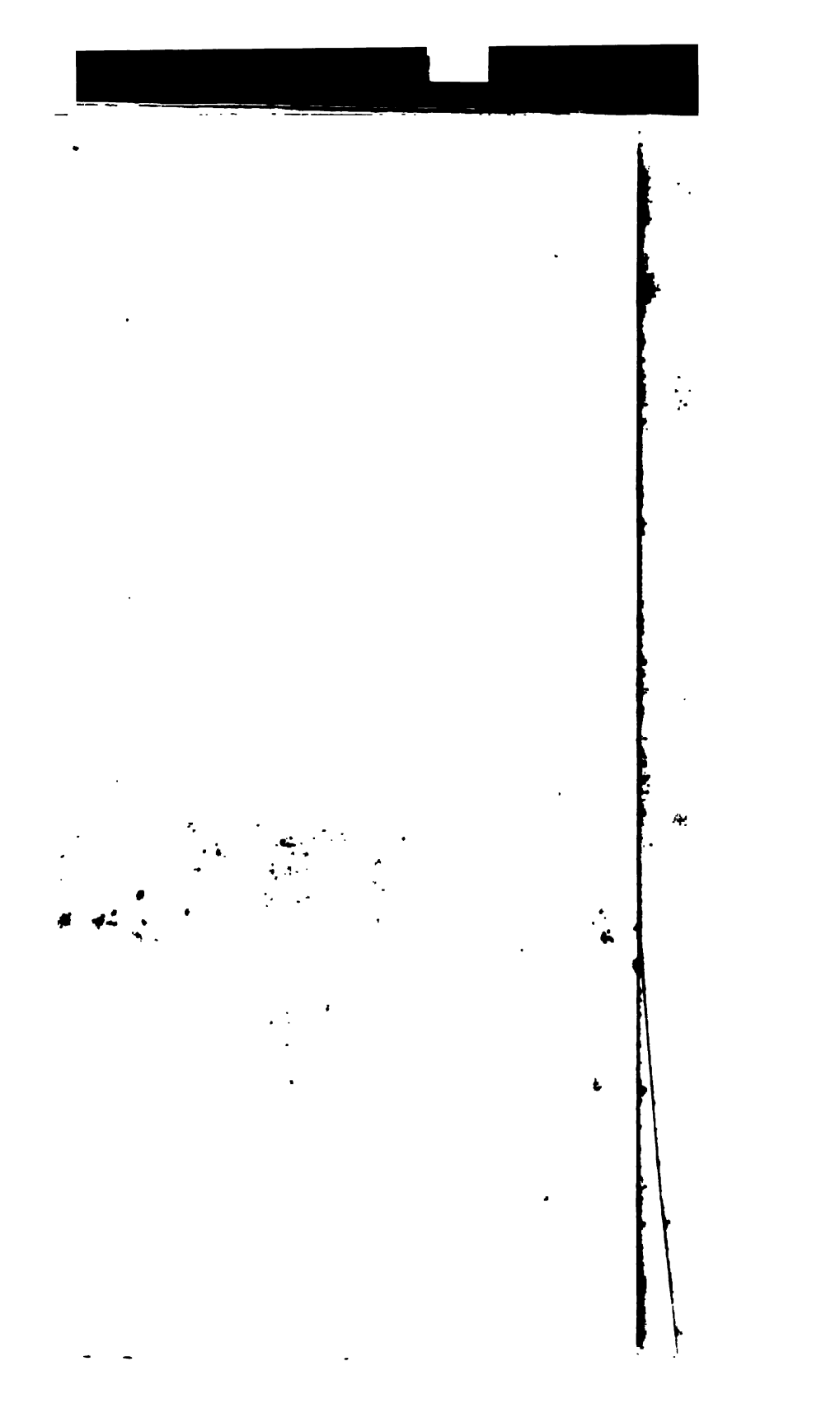

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MEMOIRS

READ BEFORE THE

ANTHROPOLOGICAL SOCIETY OF LONDON.

I.—*The Hovas, and other characteristic Tribes of Madagascar.*

By Lieut. S. P. Oliver, R.A., F.R.G.S., F.A.S.L.

It must be always a subject of great interest to anthropologists that the great island of *Madagascar*,* separated from Africa by a short distance of four hundred miles only, should present such a marked difference to that continent in its organic productions. The marked singularity of the mammal fauna, in the absence of so many African families and orders, and the existence of numerous genera and species peculiar only to the island, are well known to all naturalists. Dr. Hartlaub, the ornithologist, has found the bird-population in the highest degree peculiar, and Mr. Bates, the entomologist, in his analysis of the insect fauna, found a still greater proportion of species of insects peculiar to this island; whilst the endemic character of its flora has been shown by Petit Thouars, Bojer, and other botanists.

The conclusion forced upon us by the above facts is that, although so near to Africa, Madagascar has never had any close connexion with that continent, but that the Mozambique channel has existed as a watery barrier for a long geological

* *Madagascar* is the name given to the island by foreigners, and is not used by the natives, with the exception of those who have learnt the name from the Europeans: the Hova authorities, however, have now adopted it as the official name. The native name is "Nosindambo" (island of wild hogs), and they sometimes term it "Ny, anivony ny riaka" ("the, in the midst of the flood"). So, also, Malagasy is an adjective applied to the inhabitants and language of the country, and only partially used by a few of them on the eastern coast: Malgache, Madegasse, Malagassi, are synonymous.

period.* Some have supposed that Madagascar and the Mascarene islands, with other numerous atolls and coral reefs, have formed the site of an ancient tract of land in the Indian Ocean similar to the great Pacific continent, whose former existence and subsequent subsidence were indicated by Darwin some time ago.

How deep an interest is excited when we find Madagascar, the third largest island in the world (whose area is inferior only to that of Borneo and New Guinea), peopled by races of human beings as peculiar to their country as its fauna and flora, and in every respect totally dissimilar to those numerous tribes inhabiting the immense neighbouring continent of Africa. Ethnographically speaking, they are *Oceanic* rather than *African*. To these races the name of Malagasy has been generally applied by foreigners, although they are only known to themselves by the names of the particular tribes to which they severally belong. From time immemorial these Malagasy have managed to preserve their native independence, owing probably to the courage and jealousy of the people, to the impassable forests, bad roads, and not least to the insalubrity of the country, especially on the coast, and to other accidents; and although for many years their island has lain in the very highway of commercial traffic between England and the East Indian empire, they have remained until lately cut off entirely from settled intercourse with Europeans, and unimproved by foreign civilisation.

* Mr. H. W. Bates (the talented entomologist) explains the peculiar organic features of Madagascar by the following ingenious hypothesis, viz.: "that the island (whether previously stocked with anti-African forms or not) was at one time much more closely connected with Africa than it now is, and that the time of connection was anterior to the date when the continent became peopled by Simiidæ and the bulk of its present mammalia, but posterior to the introduction of Lemurs. Subsequently to this epoch we may suppose it to have become isolated, as we now find it; the lapse of time since the severance having been sufficient to cause the present divergence of the faunas—a divergence caused, however, as much by the extinction of old forms on the continent, once common to both lands, through the introduction or immigration of so many new ones, as by the origination of new species and genera in Madagascar allied to prototypes once common to island and continent." *Proc. Zoo. Soc.*, 1863, part iii, p. 475.

It is evident that the Malagasy have never degenerated from any original condition of civilisation, for there are no relics of primeval civilisation to be met with in the country; yet the Malagasy seem to have considerably advanced themselves in the art of building houses and originating elaborate fortifications, which they have themselves modified to suit their offensive and defensive weapons previous to any known intercourse with civilised people. They had domesticated oxen* and pigs, and made advances in the cultivation of rice, yams, etc., but whether by their own unaided intellect or by external example we cannot say. Originally they seem to have been totally ignorant of any religion; what they possess now has been borrowed from others or invented but lately by themselves for political motives.† Yet their wonderful aptitude for religious instruction is shown by the presence of eighteen thousand Christians in the province of Ankova alone. Without any written language they appear to have an elaborate structure of grammar; although many words are evidently introduced from abroad.

The various nations or tribes inhabiting Madagascar may be considered as forming two distinct races; one characterised

* During the last century "It is said of Rabiby that whilst he and his people were busy planting rice, one of them killed an animal called the *jamôka* (bullock), and ate a part of it. Pleased with his *discovery*, he continued to kill and eat frequently; and in consequence of this became so much stouter than the rest of his companions, that he was questioned by the inquisitive chieftain as to the cause of his newly-acquired corpulency, and after some hesitation confessed the facts of the case. Rabiby, like a wise man, preferring experiment to mere information, very naturally wished to make trial for himself. Finding the beef as good as had been described to him, the chief, far from indulging any jealous wish to keep so important a secret, ordered another bullock to be taken and killed in order that he might feast his companions. He also first ordered *fahitra* or folds to be made for collecting cattle, and was the first also who ate the flesh of the wild hog. The *fahitras* made by him are still preserved at the village called after him *Ambohidrabiby*." Ellis, *Hist. of Madagascar*, vol. ii, p. 118.

† "Impoina, the father of the first Radama, in consecrating some *national* idols, is said to have acted solely from political motives in the conviction that some kind of religious influence was useful in the government of a nation." Ellis, *History of Madagascar*.

Ra-haniraka, foreign secretary in 1862, remarked to me that religion was good for the *lower* classes, as it made them orderly and quiet citizens.

by small stature and a comparatively fair complexion, and the other remarkable for a larger stature and dark coloured skin. The sources of their origin must ever be a mystery to us; but still, by the aid of linguistics, we have tolerable grounds for assigning to the lighter race some previous connexion with western Protonesia, whilst we consider the darker coloured natives of the coast as the remains of the primitive aboriginals, or perhaps more accurately of an anterior population. Both these nations speak the same language, varied only as to dialect, but physically they are totally different. Neither of them has any resemblance to African types. Even their clothing shows that there is small probability of their having at any former period sprung from an African colony, for at all times it appears that the races inhabiting the adjacent continent have universally been clothed with the skins of wild beasts, fur karosses, etc.; but although numerous animals exist in the island whose skins are most suitable for the purpose, still they are never used by the natives, whilst their using so generally cloth made from the woven strips of the rofia palm or the bark of the hibiscus simply beaten out, after the manner of making cloth practised by the South Sea islanders, affords additional evidence that these inhabitants of Madagascar have a common origin in the Asiatic Archipelago with the races now found in the Pacific islands.

On the other hand, Mr. Crawfurd, who has well studied the philology of Madagascar and Malaya, although he finds many Malay and Javanese words in the Malagasy language, will not admit that any of the Malagasy are of Malay origin, he says, "The people of Madagascar are not Malays, nor do they bear any resemblance to them; they are in fact negroes, but negroes of a particular description: they are negroes in the same sense that Portuguese, Lapps, and Englishmen, Germans, and Spaniards are Europeans, and in no other—their facial angle is not so acute as that of the ordinary negro." ... "Like all other negroes they are ignorant of letters: no negro nation has ever invented an alphabet; the language was totally distinct, not only from Malay, but from every other language of Africa." "Mr. Crawfurd's hypothesis is 'that a fleet of Malay

pirates had been tempest-driven from their coast and not able to make their way back; that they had been caught in the south-east monsoon which blows south of the Equator, and had made for the first land that lay in their way, which would of course be Madagascar; that in that way they arrived in sufficient numbers to protect themselves in the first instance against the natives, then afterwards imparted to them a certain amount of instruction and conveyed to them a knowledge of the cultivation and use of vegetable productions, and finally became absorbed among them by intermarriage'." *Proceedings R. Geo. Soc.*, vol. vii, No. 2 (1863), p. 69.

I now proceed to describe the chief physical and psychical peculiarities of these tribes, which constitute the bulk of the Malagasy population, but first I will give a table of their approximate numbers, of which it is almost impossible to obtain accurate information :—

1. Malay origin?	1. Hovas	Fair ...	800,000
	2. Betanimena, 3. Betsimasaraka	Light brown ...	1,500,000
	4. Betsileo	Brown ...	1,500,000
2. Aboriginal?	5. Antsianaka, 6. Bezanozano	Deep brown ...	300,000
	7. Southern tribes and 8. Sakalavas	Black ...	1,200,000
		Total ...	5,300,000

A great extent of country is depopulated, on account of long barbarous wars, the practice of infanticide, and the cruelties of the slave trade, which account for the smallness of the population as compared with the area of this fine island, which is about 250,000 square miles, or twenty-one people to every square mile. The organisation of the Malagasy people, as I have before noticed, is referable to two distinct types. Let us first examine the light-coloured tribes, of whom the *Hova* is the true representative type. This group includes the Betanimena, Betsimasaraka, and Betsileo tribes, all of whom possess small stature, with olive complexion of different shades, more brown than black; physiognomy more Mongol than Negro, with patent and recognised affinities to the Malay; in numbers they are inferior to the black or darker coloured tribes, and they

inhabit the Highlands inland and part of the eastern coast of Madagascar.*

The Hovas.

The first in importance of all the tribes inhabiting Madagascar is the race of Hovas, who occupy the central province of Ankova, a highland territory occupying a plateau some five thousand feet above the sea level. In numbers far inferior to any of the black tribes of Madagascar, they comprise about one-sixth of the whole population of the island, but from their superior intelligence and power of military organisation they form the dominant race, and rule absolutely over the other races, which together are five times their number.

Physically these Hovas form a fine, noble, well-built race of men. Robust and active, nevertheless they are mostly below the middle stature, which indeed but few of them ever exceed. Their figures are erect, with small but finely-formed limbs of good proportion, whilst their gait and movements are remarkably graceful, free, and agile. Although distinguished by their promptitude and activity, their strength and endurance is inferior to that of the other neighbouring tribes, and they are easily susceptible of fatigue from travelling or labour; this, however, I imagine, only proceeds from the fact of the Hovas as a rule not being brought up to undergo as much manual labour as the slaves under them, who excel in carrying great weights for long distances.

Physiognomically speaking, they are eminently noticeable for their well-shaped heads, rather flattened at the back, with high foreheads, often of an European cast of countenance (in some few instances the distance between the hair and eyebrows is comparatively narrow), but generally indicative of considerable

* The Protonesians are peculiar in their distribution; it is rarely that they form the exclusive populations of those lands on which they are found. On the contrary, they are found chiefly in the *lighter* variety; but they are always found in the interior or more impracticable parts, and always as an inferior population. The migration of the Kelænonesians took place anterior to the spread of the lighter tribes. (Dr. Latham.)

A parallel case is found in the Feejee islands, where there are two races, light and dark, the Amphinesians and Kelænonesians. Mr. Crawfurd says that five hundred of this light-haired race are able to turn the scale of success against twenty thousand of the darker Feejeeans.

intellectual capacity as well as moral excellence. Their features are rather delicate than prominent. The nose is small, firm, and well chiselled, never thick and fleshy, and sometimes of pure aquiline shape, more frequently straight, now and then short and broad, without fullness at the end, the facial angle is large; their lips are occasionally thick and slightly projecting, seldom round and large, but often thin, and the lower gently projecting (this latter from snuff-taking, I believe), as in the Caucasian race, with short haughty curling upper lip. Their eyes hazel, clear, and lustrous, but small and piercing. Their hair is jet black, but soft and fine, straight or curling (Tsotra, Tsobolo); a few, indeed, have frizzy or crisped hair (Ngita), but this evidently does not belong to the true original Hova type. They used to plait their hair, but since 1822 have usually cut their hair short in European fashion, adjusting it with grace.

The Hova women wear their thick glossy hair elaborately dressed, and plaited in extremely fine plaits and braids, tied in a number of small knots all over the head, giving a stiff and rather formal aspect to the contour of the head and face. There are ten or twelve different modes of arranging these plaits. The unmarried females allow their locks to flow negligently over their shoulders. There are few grey-headed people to be met with, and they are scrupulously careful to remove their grey hairs, as it is a matter of importance to them to avoid as much as possible any symptoms of age, and it is always an object of great desire to appear or be thought young. Their beards are but weak, and the hairs are plucked out when young; they frequently wear moustachios, generally thick and clipped close.

The colour of their complexion is olive, more or less dark, but frequently lighter than that of the inhabitants of Southern Europe; the vigour of health often imparts a ruddy tinge to their countenances; but this, whilst it removes them from approximating in complexion to the yellow hue of the Malays, does not give them any resemblance to the copper-coloured Indians of America.

The men are better formed than the women, in whom there

is a tendency to become corpulent. Their hands are not so warm to the touch as those of Europeans, and their blood is by thermometer colder. They are industrious, intelligent, and to a certain degree half civilised. They are most kind and affectionate in their natural relations, cheerful and hospitable, and capable of the warmest friendship, but superstitious and mendacious in the extreme. They are quick at learning, and have a retentive memory. They are very sensitive, and possess great natural dignity, being extremely amenable to law and order, and the constituted authorities.

The Hovas are not the aborigines of this part of Madagascar which they now inhabit, and it is impossible to determine with any certainty from what part of the island they came. It is, however, their own general belief that they came from the south-east of Madagascar, and had advanced inland, gradually dispossessing the aboriginal inhabitants. At all events, the Hovas are a race entirely distinct from all the rest of the natives of Madagascar: from wherever they have come, they have in every respect the pre-eminence and superiority over the other tribes.

There are several reasons why the Hovas should be fairer than their neighbours: they wear more clothing to begin with, and expose their bodies less than any of the coast tribes; besides, living in a mountainous district at high elevations, with a cooler and more salubrious climate, generally conduces to fairness of complexion; whilst vast rivers, alluvial deposits, and swampy countries under a tropical sun are found always to determine a tendency to the colour of the negro, a fact frequently confirmed and fully borne out by the colour and country of the black tribes of Madagascar. The Assamese are examples of this distinction; they, a mountain race, being light in comparison to the inhabitants of the neighbouring swamps of Cambodia and Pegu. So in Fernando Po, an island only twenty miles distant from the mainland of Equatorial Africa, but rising 4,000 feet above the sea, the Ediya family have much lighter skins and softer hair than the African negro. Capt. Beechey remarked that throughout the whole of Polynesia the lower coralline islands always

contained a darker people, whilst the higher volcanic islands possessed lighter coloured inhabitants.

The language of Ankova may be considered as the standard of the Madagascar dialect. It is the most copious and least nasal.

There seems to be no doubt that the Teninkova, or vernacular dialect of the Hovas, from its intimate relationship to the original Malayan or Polynesian language, points to the Indian Archipelago of which Java is the head-quarters as the ancient cradle of the Hova race; but it is equally uncertain at what time, or in what manner, this migration across the Indian Ocean could have taken place, nor are there any legends remaining which allude in any way to such a fact.

Mr. Ellis, on first landing at Tamatave, was surprised at the perfect identity of the Malagasy and Eastern Polynesian languages in the names of many things common to both, such as a cocoa-nut tree, the name of which they pronounced precisely as a South-Sea-islander would have done. So also with the Pandanus or vacoua tree, one of the most common trees on the coast of Madagascar; and in Tahiti also; the words for *flower* and the names of the parts of the human body. The numerals also he found, with but slight variation, were identically the same; but he observed that, although in many respects the language retained the same simplicity of structure and arrangement, it was in some instances more defective, while in others, especially in the structure and application of its verbs, it was far more extensive and complex than the Polynesian language. The Hova language exhibits an instance of a people but half-civilised, using a language copious, precise, and philosophical, and only oral, having been till within the last forty years an unwritten language. That they now possess a written language is entirely due to the London Missionary Society. It is noticeable that the dialects of the tribes on the coast more nearly resemble one another than any one of them can be found to resemble that of the Hovas; so that we are accordingly led to suppose that the Hovas are a people of later introduction to the island than the coast tribes, who appear to have been the anterior inhabitants of the country. These I will now proceed to describe.

The Betsimasaraka and Betanimena.

These seem to form but one people, and next to the Hovas are the fairest race in Madagascar. It is supposed that they arise from a blending of the aboriginals of the east coast and the *Zafindramina*, some remnants of an Arab colony. (Members of this same colony inhabit the island of St. Mary's, where they style themselves *Zafibrihama* or descendants of Abraham.) But there is doubtless a great admixture of Hova blood in their veins. They are particularly cleanly in their houses and habits, but degraded in morals, and extremely apathetic and indolent. Intercourse with Europeans has produced marked European features amongst many of them; generally they have larger heads and less marked features than the Hovas. The *Betsileo* (or "invincible") resemble the Hovas also, but are much darker; they are more agricultural and less warlike than their neighbours the Hovas, and inhabit the high mountainous region south of Ankova. They are slender and of low stature, of various shades of brown, with long black curling hair; they are patriarchal in their mode of life, and have modest and unassuming manners. There is a branch of them called the *Betsileontanala*, a body of whom attended at the capital on the coronation of the queen under their female chieftain Jovana. Ellis describes her as having a complexion of a mellow brown, regular features, open countenance, with dark glossy hair braided: she excelled in oratory, and appears to have been as brave in war as wise in council.

The Sakalavas.

The second division of the Malagasy population is the dark-coloured variety, of which the Sakalavas are the typical representatives. They are distinguished by greater stature, dark complexion, and physiognomy as much Negro as Mongol, and include the North and South Sakalavas, the Antsianaka, and Bezano-zano; they have been an anterior population to the Malay Hovas, but are perhaps themselves connected with the Kelænonesian branch of the Oceanic group, if not true aboriginals. The Sakalavas sometimes are divided into North and South Sakalavas, but anthropologically speaking they may be said to include all the black tribes of the western coasts, and comprehend the outlying Bezano-zano and the Antsianaka to

the north of Ankova. Their head-quarters may be considered at Iboina and Menabé, to the king of which for many years the Hovas paid tribute, until Radama I. invaded their country, and, forming an alliance with their chief Ramitraha, married Rasalimo, his daughter, in 1826. (This princess was still alive when I visited the capital in 1862, when she used to appear at the court ceremonies.) The Sakalavas are a brave and generous people; physically considered they are the most athletic race in Madagascar. Capt. J. C. Wilson, R.N., in his *Notes on the West Coast*, declares "that the Sakalavas are the finest race of savages he has ever seen; that they are far superior to the Hovas in strength and appearance, but not nearly so intelligent. They are strongly built, tall, independent fellows, with the African cast of countenance, though generally much better looking." They are robust, but not corpulent; their limbs well formed, muscular, and strong. Their complexion is of the deepest hue, much darker than that of the other Malagasy; their hair crisped and curly, but not woolly. Their features handsome, regular, and prominent; open and prepossessing countenances, with dark eyes and a keen and piercing glance. They are indolent when secure at home, but in war they are energetic, brave, and resolute. They are much addicted to divination, sorcery, and all superstitions. They are generally of a friendly disposition towards Europeans. They are exceedingly fond of ornaments of silver and ivory, and occasionally wear a ring in their nostrils, and a circular ornament of ivory, silver, or shell, on the forehead. "They carry flint muskets, carefully kept in order, with the stock ornamented with numbers of brass-headed nails and well polished; as enemies they are not to be despised, being capital shots, as the French well know from experience on more than one occasion." (Wilson.)

"They grow large quantities of rice, more particularly about the marshy country about the Ozsanga river; but on the whole the natives are more pastoral than agricultural in their habits. Their houses, like those of the east coast, are beautifully clean and comfortable, and of the same construction. Morality here is at a low standard, *virtue* being *unknown* among women; though it must be said that when married

they are constant to their husbands. It is sad that this deplorable state should be so universal throughout this beautiful island, and that, though in many respects superior to other coloured nations, in this they are so far beneath them." (I myself doubt whether they are so much below other savage nations in this respect). As I have never been in the Sakalava country myself, I have given the above extracts from Captain Wilson's notes.

They are in the habit of making incisions in their faces and bodies. They wear their hair plaited in small knots, and sometimes wear wigs made often of the skin of the hump of the zebu oxen. Whether they have derived the custom of cutting their bodies from the Mozambiques or not, is unknown; but there is certainly a similarity. So also there "appears to be a resemblance, amounting to identity, between a number of words used by the Malagasy and the natives of the Mozambique coast and of the adjacent interior." "It is impossible to look over a map and not perceive the obvious similarity between the names of the districts and rivers of these countries severally: such, for example, as Masambika = Mozambique; Kilimany = Quilimane; Sambesy = Zambesi; Zimba, Inhambany, Manisa; which have not only a perfect resemblance to Malagasy names, but are either Malagasy roots variously combined, or actual words in the Malagasy language." (Rev. J. J. Freeman.)

The Sakalavas still carry on a trade in slaves from the east coast of Africa: from somewhere about Angora river across to Cape St. Andrew's, they are brought in Arab dhows; the Sakalavas give four head of cattle for one slave. (Wilson.) There is certainly a treaty between the Hovas and English relative to prohibition of the slave trade; but though the Hovas are nominally recognised as the rulers of the island, they have only one military station at Majunga, at the mouth of Bembatooka bay (into which the important river Betsiboka runs, forming the route from the capital), and the Sakalavas are in reality perfectly independent.

The BEZANOZANO ("*anarchical*") and the ANTSIANAKA ("*not subject to others*") resemble one another very closely, and are

outlying branches of the Western Sakalavas. They are stout, not very tall, of black colour, with flat features, short neck; the former are the best coolies for carrying burdens in Madagascar. From constantly carrying heavy burdens on bamboos across their shoulders, they are noticeable for large humps on their shoulders, a provision of nature, these humps forming natural cushions saving the collar-bone from any concussion.

The MANENDY are another branch of the darker coloured Sakalavas: they live between the Betsiboka river and the sea. The Hovas say that the Manendy can live on leaves and roots; but Mr. Hastie, who visited them, was struck with their superior culture of the soil.

Another branch of the Sakalavas, namely, the VANGIANDRANO tribes from the south of the island, are described by Ellis as a striking race of men. They appeared tough and agile. These men were ornamented with bands round their foreheads, to which round pieces of polished shells were attached just over one temple.

Raloba, chief of Vangiandrano, is thus described:—"He moved about among the crowds a head and shoulders above his fellows—above seven feet high; his figure was thin; his head broad, and rather large; his features slightly prominent; his eyes small; his hair slightly grey; his limbs bony, but not muscular. He wore an open-breasted shirt, and above this a large native lamba. His head was covered with a singular cap of scarlet cloth, fitting close round the forehead, but drawn together in a line about a foot across above the crown. From this line the upper end of the cap, which tapered gradually to a point, was doubled down behind the extreme end, reaching below the waist. The cap itself was ornamented by a large solid oval piece of light green glass in front instead of a precious stone. The edges were covered with some kind of bright yellow bordering extending along the part which hung down, and terminating in a large yellow tassel, like the tassel of a bell rope." . . . . "These inhabitants of Vangiandrano and the country about Faradofay (Fort Dauphin) are famed as spearmen throughout the island, and are not allowed to sleep in the city: they are said to be *mahay*, i. e., *to know what to do with the spear.*"

They exhibited their manner of fighting with shield and spear, thus described:—"In the war game now exhibited no spear was hurled, the fighting was at close quarters, and was an exhibition of personal encounter. No shouts or yells were uttered; it was silent earnest business. When there was a little distance between the combatants, they held the spears near the middle of the shaft: but in hand-to-hand encounters close to the head of the weapon. The small-sized men were selected, and seemed to be the best spearmen; steadiness of eye and agility appeared to be of more importance than great stature or strength. One little tough-looking individual elicited immense applause. A thrust that it was supposed would have told on the person of his antagonist, had the spear not been purposely lowered, was followed by throwing up the shield in the air and catching it by the handle as it fell with the left hand. The shields are circular; not large nor fixed on the arm, but held in the hand by a handle left in the wood inside the shield." (Ellis, *Madagascar Revisited.*)

The Akongros.

The Akongros are mentioned by Capt. Rooke, R.A., as a tribe independent of the Hovas, whose head-quarters are two hundred miles south-west of Mananzari. Their chief town is said to be situated on the summit of a steep hill, the sides of which they have scarped quite perpendicularly, so as to render their stronghold impregnable against an enemy unprovided with artillery. It is said to contain 30,000 inhabitants; and, although the Hovas had repeatedly attacked it, they had always been repulsed with great loss, the garrison being assisted even by the women, who rolled down rocks and logs of wood upon their assailants. Capt. Rooke saw about twenty of these Akongros who were in Mananzari on a friendly visit. "They were," says Capt. Rooke, "rough, powerfully-built, good-humoured fellows, wearing conical straw hats, and armed with swords and spears." They performed a war-dance, and assured Capt. Rooke's party that no harm should befall them if they paid a visit to their stronghold, an invitation which, unfortunately, they were unable so accept.

The Hearianas

Are another sub-division of the Sakalavas, and occupy a part of the country west of the Betsileo and south of Menabe. They are taller than the Betsileo and less robust and muscular than the Betsimasaraka; their features smaller; colour darker; hair crisp, but not woolly, matted, nor abundant; they have sinewy limbs, with free and agile movements. They are probably the result of intermixture of Betsileo and Sakalava blood.

The Vazimba, or Kimos.

The Vazimba are supposed to have been the first occupants of Ankova; they are described by Rochon under the name of Kimos, as a nation of dwarfs, averaging three feet six inches in stature, of a lighter colour than the Negroes, with very long arms, short woolly hair. As they were only described by natives of the coast, and have never been seen, it is natural to suppose that these peculiarities were exaggerated; but it is stated that a people of diminutive size still exist on the banks of a certain river to the south-west. There are many tumuli* and cairns throughout the country held in reverence by the Malagasy, as the tombs of the Vazimba, which, if opened, might throw light on the subject. Some of the Betanimena have curious ideas of their ancestors and their origin, believing that they sprang from the Babacootes or large Lemurs of the forest. Last year only, one of the officers following the queen on her visit to the coast, having shot a Babacoote, was degraded to the ranks and condemned to carry the Babacoote back to Ankova and have it properly interred. So they seem to have an idea of the *missing link!!*

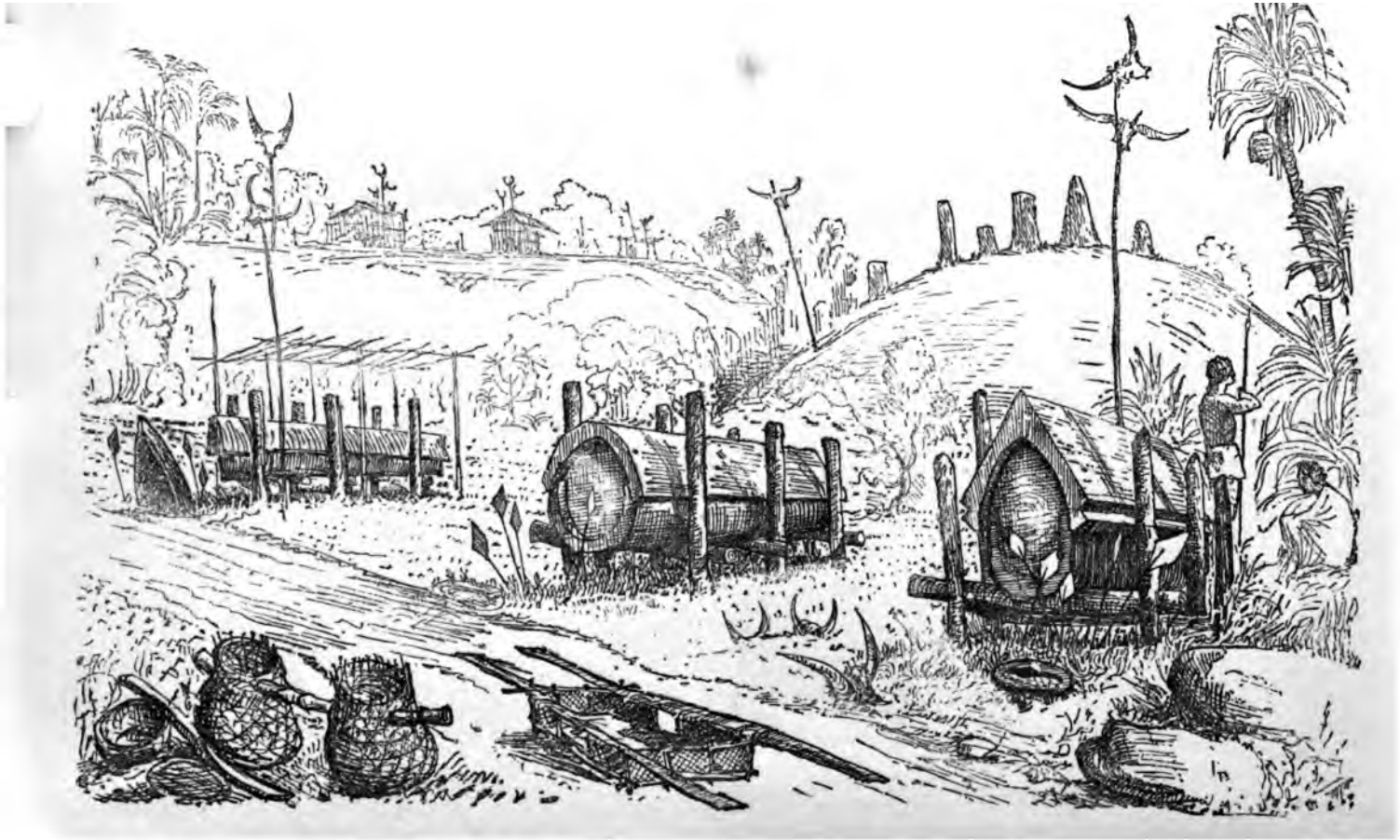
With regard to the native *Religion* of the Malagasy, they can hardly be said to possess any form of faith whatever; their creed (if that term may be applied to the few and confused notions entertained on the subject) seems to consist of little

* The barrows of the Vazimba resemble closely the ancient tombs of the Indians in the Chontales district of Nicaragua. It would be a difficult task to persuade the natives to open them, as they have a superstitious horror of desecrating their graves.

more than an heterogeneous compound of superstitious terrors and practices.

Certain barbarous ceremonies and unmeaning usages exist which have been handed down from their forefathers; but they have a very vague, indefinite notion of a Deity, applying the term "Andriamanitra" (literally "the fragrant prince") to their sovereign, their idols, individually and collectively, their dead, to anything supernatural, a phenomenon of nature, and to the *genius* which animates their various charms, divinations, ordeals, etc.

Their ideas on these subjects are evidently borrowed from other nations; thus they practise the rite of *circumcision* learnt from the Arabs, but as a civil rather than a religious ceremony. The *Vintana*, or fixed immutability of their destiny, answers to the doctrine of fate taught in the Koran of the Mahometans. The *Fandroana*, or national new year festival or lustration, has an obscure but evident relation to the Jewish Passover. Purifying and bathing are universal on the occasion: cattle are slain, and their blood is sprinkled on the doorposts of their houses, where it is allowed to remain throughout the year. A *hasty* meal is *prepared* and eaten, and general festivity ensues. The ordeal by *Tangena* (so long practised, but happily now rendered obsolete by law), or poison, is slightly analogous to the ceremonial of ordeal by *bitter waters*, practised by the Jews (Numbers, ch. xxxi, verse 11.) The *Faditra* and *Sōrona* have an affinity to the cleanse, sin, and wave offerings of the Pentateuch, and bear some resemblance to the institution of the *scape-goat*. So also the *Sampy*, or idols, correspond closely to the *Teraphim* of the old testament. *Mosavy*, or witchcraft, is punished by stoning to death, as in the law of Moses. Their *Fady* is equivalent to the *Taboo* of Polynesia. Their *Ody*, or charms and amulets, have perhaps a small relation to the African *Fetish*. The *Fanandro*, or genethlialogy, a peculiar casting of nativities, is also derived from ancient eastern nations. The *Skidy*, or divination, alone seems peculiar to the Malagasy themselves, and is highly original. It is not based on astronomy, necromancy, or magic; but its nature is oracular, and calculated from a fixed process of the permuta-



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SEPULTURE.

They have great veneration for their dead, who are buried in large solid wooden sarcophagi, which are afterwards placed either in handsome mausoleums or simply in wooden houses or under mere sheds (*vide* the Illustration).

The Malagasy press the juice from the sugar-cane by an ingenious and simple roller (*vide* Sketch), and ferment a drink called *toaka*, from the liquors. They have a curious way of taking tobacco in the shape of snuff, but place it under the tongue instead of in the cheek, like a sailor's quid. They also in secret smoke *rongona* or hemp.

The Malagasy habits of life are simple and conduce to *longevity*, and throughout the whole island there is an unusual amount of very aged persons; in fact, centenarians are common.

CASTE.

There seems to be a solitary instance of "caste" distinction among the *Hovas*, claimed by a clan named the Zanakambony. They live about eight miles from Antananarivo, and are the descendants of the original conquerors of that town. Their peculiar privileges, which they maintain with great tenacity, are as follows; viz.—The right of carrying the bodies of the deceased kings and building their tombs and *tranomasina*, or houses, over them. They are exempt from working for the king except in smiths' works; so they may make a spade but not use it. They look upon it as a degradation to erect a fence, to associate with other clans, nor will they lend others even a mat or drinking vessel, nor will they eat out of the same dish as other people. They are very strict in adherence to rites and ceremonies, are very poor, indolent, and proud, and consequently ignorant.

POLYGAMY

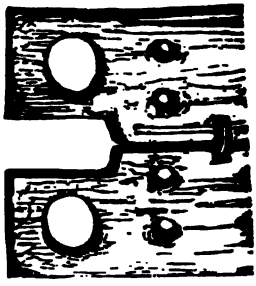
Exists under the sanction of the native laws. The sovereign is allowed twelve wives; but, as a rule, no man has more than three or four, and, still more frequently, two is the number. It is considered essential to any one of rank to have more than one wife. The native word for polygamy is *fam-*

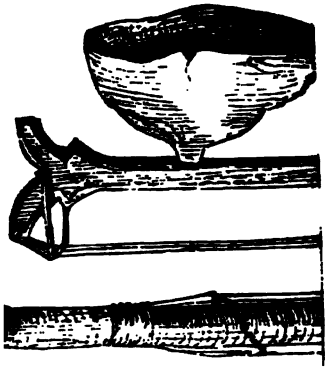
porafesana, "the means of causing enmity". The wives, however, keep perfectly separate establishments. Divorces are frequent, and widows are not allowed to marry within twelve months of their husband's decease. Many of both sexes are married at twelve years of age; they frequently become parents shortly after the ages above specified (Ellis, vol.i,p.163).

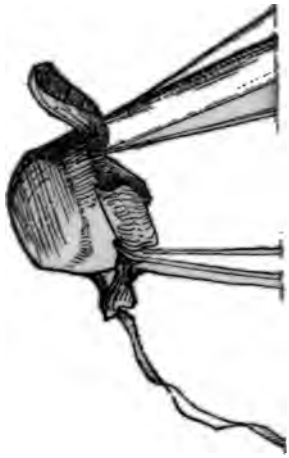
The genealogy is traced through the female line on the supposition that parentage is more easily identified on the mother's side. An unmarried queen is supposed to have the right of having a family by whom she may think proper. The children are recognised as legitimate by their relation to the mother, and no questions made as to the paternity. It was often asserted that M. Laborde was the father of the late king; but with what foundation I cannot say. Throughout the island, as may be easily imagined, immorality of every description prevails, and a stranger arriving on the coast certainly sees the worst of it. For instance, whenever a vessel arrives at Tamatave or other port on the coast, the officer of customs inquires the number of the people on board, and shortly after canoes approach the vessel with women corresponding in number to those of the ship's officers, crew and passengers, who proceed to pass the night on board. Unless intercourse is allowed with these women, the ship will not be permitted water, provisions, or to traffic in bullocks, etc. Our own cruisers have been obliged even to submit to this requisite demonstration of amity. Inland also the young unmarried women are brought to the notice of the passing traveller in dances of a suggestive character.

The Malagasy are very fond of music and singing, and have a quick and retentive ear. Their native musical instruments consist of wooden drums (fig. 4); the *lokanga*, a stringed instrument with a hollow calabash (fig. 2); the *valiha*, a sort of bamboo harp (fig. 3), of a very original character. They also blow conches as trumpets, and clap their hands in unison as a chorus.

In many of the villages the instrument to which they dance consists of a large hollow bamboo held at each extremity by a little girl, whilst the musicians simply stand in a row and tap







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volving the whole family, and confiscation of property are common punishments. Pecuniary fines, imprisonment and chains, with hard labour, etc. Maiming is sometimes practised. The public judges can inflict only punishments not capital, death being exclusively in the hands of the sovereign. If a criminal can obtain a sight of the sovereign he is pardoned, or if the sovereign accepts a *hazina* sent to him. So at the coronation of the present Queen Rasoherina, some of the Menamaso who had escaped the massacre of their comrades obtained a commutation of their sentence (Ellis).

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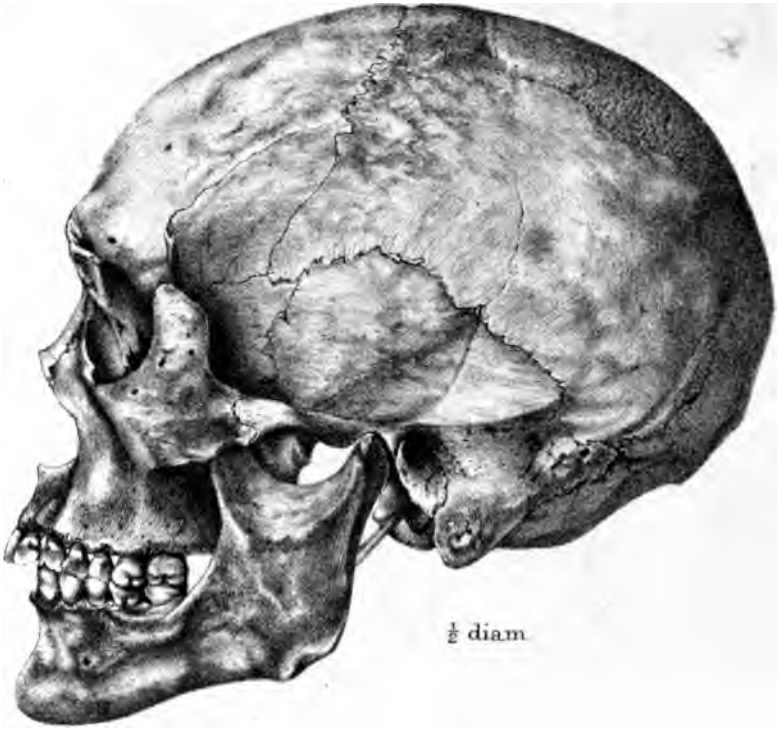
SKULL OF AINO MAN



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SKULL OF AÏNO MAN

II.—*Description of the Skeleton of an Aïno Woman, and of Three Skulls of Men of the same race.* By Joseph Barnard Davis, M.D., F.R.S., F.S.A., V.P.A.S.L., etc.

Unexpected circumstances enabled me, some time ago, to examine a fine series of bones of the aborigines of the Island of Yesso, in Japan, of which it appeared in some measure a duty to give as accurate an account of such very rare objects as was in my power.

I. (*a*) The skeleton of an Aïno woman. Of skeletons of exotic races, those of men almost universally prevail; those of women occur only occasionally, without it be in the rich collection of the Galerie Anthropologique of the Jardin des Plantes of Paris, where there is an unusual number of the skeletons of women of exotic races. There will be some difficulty in finding the means of comparison of this Aïno example with other skeletons of women. With the view of obtaining some aid in our attempt, we shall refer to—

(*b*). The most famous skeleton of an European woman, derived from the celebrated Von Sömmerring's Collection, and now contained in the Anatomical Museum at Giessen. It is the subject of his beautiful *Tabula sceleti feminini.** She was a native of Mainz, died at an early age, about twenty years, and her skeleton was selected "e sceletis puellarum bellissimarum" of his museum, as approaching closest in form to the Venus di Medici.† It would be, in some respects, too severe a test to compare this skeleton of a young German woman, of unusual elegance of conformation, with that of the Aïno wo-

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* *Trajecti ad Mœnum*, 1797.

† "Ne autem aliquid deesset, imprimis pulchritudini ossium capitis, comparavi illa sollicite cum cranio pulcherrimo feminæ Georgianæ in collectione rarissima Blumenbachii, nec sine voluptate animadverti, puellæ meæ bellissimum caput osseum optime cum illo convenire."

man; still, some results in aid of our description may ensue from a slight comparison of the two.

(*c*). The skeleton of an Australian woman, aged about thirty-five years (No. 1261† of my Collection), from the province of South Australia.

(*d*). The description of the skeleton of another Australian woman, considered to be above forty years of age, from the neighbourhood of the Murray River, in South Australia.*

The two latter skeletons are selected for comparison, because (*c*) is the only other woman's skeleton in my Collection, and (*d*) is the only one I know of in which a number of the same measurements are given. That they are of a very distinct and different race from the Aïno woman, may be favourable to bringing out diversities clearly.

(*a*). The age of the Aïno woman appears to have been about twenty-five years. The two upper *dentes sapientiæ* are in full position and development. The lower ones have not been developed at all. The teeth are all beautifully perfect, and rather large. The entire length of the skeleton is five feet English, or sixty inches, which is 1522 millimetres. This gives a stature that, as an average, would be considered short, although many English women are not taller. The calvarium is of good oval form, not at all unlike the western European. The face rather prognathous. The nasal bones and the nostrils somewhat broad. The vault of the calvarium may be considered rather flat, and the supraoccipital region full; but *the more decided feminine characteristics*,—fullness in the lower occipital region and delicacy of the mastoid processes,—are distinctly present.

There is a general appearance of robustness in the skeleton, indicated in the humeri and the femora, and all the other long bones, especially in their articular extremities. The vertebral column may be regarded as having six *lumbar* vertebræ; the first being like a dorsal vertebra, without any articular facet for a twelfth rib, yet not possessing the large direct transverse

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* *Zur Kenntniss der Eingebornen Südaustraliens.* Von Prof. Alexander Ecker. Berichte d. naturf. Ges. z. Freiburg, ii Bd.

processes of the other lumbar vertebræ.* There are eleven ribs on each side.

(*b*). In turning to Von Sömmerring's skeleton of the German woman, it is at once seen that the two crania differ materially. That of the latter is characteristic of her race, and more pleasing in the eyes of Europeans. The bones of the Aïno woman are all of a ruder conformation,—more robust. The proportionate length of the vertebral column is the same in the two skeletons. The humerus is decidedly longer in the German; yet the length of the whole upper extremity in the Aïno slightly exceeds that of the other skeleton. The femora, again, are decidedly longer in Von Sömmerring's skeleton, and the notches between the heads of the thigh-bones and the greater trochanters are much deeper. But the most remarkable discrepancy is in the length of the bones of the leg. The tibia and fibula of the Aïno woman are disproportionately short, in a very obvious degree. Her feet are also broader. There is a striking disagreement between the pelves of the two skeletons. The German woman's exceeds the other in its transverse development, the ilia being evased, and the superior opening transversely oval; whilst that of the Aino woman is more expanded in the conjugate diameter. This feature will be seen in the measurements given hereafter. The whole pelvis bears the appearance of narrowness, the hips being nearer to each other. Such peculiar conformation in the pelvis of the Aïno woman is quite unfeminine and un-European. The distinguished Professor Carus, in his fine work *Proportionslehre*, asserts that there is such a difference in the form of the pelvis between his "day-people" and his "night-people", and says that in the latter the whole pelvis is longer and narrower.† Von Sömmering had already declared the pelvis of the Negro to be narrow.‡ In both, shortness of the leg-bones and narrowness

* Von Sömmering alludes to a very different abnormal condition of the vertebræ in one of his Negro skeletons. He says, "In einem meiner Negerskelete sind sechs Lendenwirbel bey übrigens vollzähliger Zahl der andern Wirbelbeine, so wie ich dies bey mehreren Europäern gefunden."—*Die Körperliche Verschiedenheit des Negers*, § 33.

† *Proportionslehre*, § 15. Leipzig, 1854, fol.

‡ *Op. cit.*, § 34.

of the pelvis, the skeleton of the Aïno woman approaches to that of the male gorilla, yet without giving any countenance to the developmental hypothesis.

(*c*). The skeleton of the Australian woman (No. 1261† of my Collection) is 4 feet 10·7 inches, or 58·7 inches long, that is, 1491 millimètres. The skull of this Australian woman is long, narrow, and low, and exceedingly prognathous. It has a broad nose, wide nostrils, and a wide mouth, with unusually large teeth. It is full in the supraoccipital region, and rather flat on the upper surface, and it is also full in the infraoccipital region. The bones of the entire skeleton are very slender.

(*d*). The skeleton of the other Australian woman is 1508 mm. in length; so that the longest skeleton of the series is that of the Aïno woman (No. 1456†), or *a*, and the shortest that of the Australian woman, *c*.

But what is the most obvious and striking difference between the skeletons of the Aïno and of the Australian women, is the decided robustness of the former, and the remarkable delicacy and slenderness of the bones of the latter. This extends from the bones of the extremities to the clavicles and ribs. It is difficult to convey a true idea of this contrast between the two without actual inspection. Whilst the former exceeds the mean of European women's skeletons in the diameter and stoutness of the bones of the limbs; the latter, in these particulars, comes decidedly short of the European female mean. As the best mode of indicating this diversity of size in the bones, I have taken the circumference of the femur of the Australian woman, at the most slender part of the middle of the shaft, and find it to be 2·7 inches, or 68 mm.; whilst that of the Aïno woman measured in the same part, is 3·3 inches, or 83 mm. This is a difference between the two of upwards of half an inch. The same difference is perceived by taking the diameter of the lower extremity of the femur, above the condyles, at its widest part. That of the Australian woman gives a diameter of 2·55 inches, or 66 mm. That of the Aïno woman, of 2·9 inches, or 73 mm. The patellæ are much larger in the latter. All the other bones of the limbs keep up the same proportionate diversity, so that the hands and feet of the Australian woman present a remarkable gracility.

Perhaps the delicacy of the frame-work of this Australian skeleton is nowhere more obvious than in the structure of the pelvis. When compared with other pelves, this may be looked upon as a basin made of *eggshell-china*. All the bones are so frail and thin and light; whilst, at the same time, the bones of her cranium are so thick and heavy. It is a happy thing that the fragile pelvis of an Australian woman, containing a series of organs so essential to life and being, should be hidden in soft parts, and further protected by its central position from injuries to which it would otherwise be continually liable. Her exposed head, on the other hand, is defended by the dense osseous plates of the skull from the effects of the constant and severe blows to which it is subjected. The spinous processes of the *ossa pubes* are unusually developed and prominent.

This remarkable difference between the robustness of the skeleton of the Aïno woman, the general thickness of its bones, and the slenderness of that of the Australian woman, should not be passed over without noticing that all voyagers have observed the strong bodily structure of the Aïnos. La Pérouse remarked it. On the contrary, the Australians, as a people, are conspicuous among all races for the thinness of their limbs, and the gracility of their bones. So that, although for illustration we have compared the two skeletons, there is no resemblance between them in respect to the development of their osseous tissues.

Recollecting this absolute difference in the circumferential development of the long bones in these two skeletons belonging to different races, we will endeavour to ascertain what are their relations in respect of the length of the individual long bones, and the dimensions of other parts. For this purpose a tabular view will be best.

TABLE I.—MEASUREMENTS, ETC., OF THE AÏNO, AND OF TWO AUSTRALIAN SKELETONS (*see next page*).

By this table it appears that the proportions of the Aïno woman's skeleton are peculiar. The vertebral column is very short, thirty mm. shorter than that of the two Australian women. The bones of the arm (humerus, ulna, and radius)

TABLE I.—MEASUREMENTS, ETC, OF THE AÏNO, AND OF TWO AUSTRALIAN WOMEN'S SKELETONS.

	Aïno Woman, æt. c.25. No 1456†.		Australian Woman, æt. c.35.—No. 1261†.		Australian. Young (A. Ecker).	
	Eng. In.	Milim.	Eng. In.	Milim.		Milim.
1. Height of the skeleton, from the vertex to the base of the os calcis	60·0	1522	58·7	1491		1508
2. Length of the vertebral column, from the upper surface of the atlas to the lower surface of the last lumbar vertebra	21·5	546	22 6	575		576
3. Length of the os sacrum, in a right line	3·7	95	3·9	99	3·9	99
4. Breadth of the os sacrum	4·	102	3·5	88		
5. Height of the entire pelvis. From a line on the level of the top of the cristæ iliorum to another on a level with the lower surface of the tuberosities of the ischia	6·9	175	6·5	163		
6. Distance between the cristæ iliorum, inside	8·8	223	8·	203		
7. Distance between the anterior superior spines of the ilia, inside	7·2	182	6·2	156		
8. Transverse diameter of the superior opening of the pelvis	4·7	120	4·6	116		112
9. Conjugate diameter of the superior opening of the pelvis	4·6	116	4·	102		
10. Pelvic index, or ratio of conjugate to transverse diameter, taken as unity	·97		·87			
11. Transverse diameter of the outlet of the pelvis, inside	4·3	110	4·3	110		
12. Conjugate diameter of the outlet	4 9	124	4·3	110		
13. Breadth of the shoulders. Outside the acromia	13·1	332	12·1	306		282
14. Length of the humerus, extreme length	11·3	286	13·3	312		298
15. Length of the ulna, extreme length	9·4	237	9·6	242		252
16. Length of the radius, extreme length	8·5	215	8·9	225		231
17. Length of the hand	6·9	175	6·	152		
18. Length of the whole upper extremity	26·5	673	26·7	681		
19. Length of the femur, extreme length	16·3	414	16·3	414		413
20. Length of the tibia, extreme length	12·7	318	13·9	353		344
21. Length of the fibula, extreme length	12·7	318	13·1	331		
22. Length of the foot, extreme length	8·5	215	7·7	195		
23. Length of the whole lower extremity	31·2	792	31·8	814		807
24. Proportion of the length of the arm to that of the leg = 100	·84		·83			
25. Proportion of the length of the radius to that of the humerus = 100	·75		·70		·77	
26. Proportion of the length of the tibia to that of the femur = 100	·76		·85		·83	
27. Proportion of the length of the femur to that of the stature	·272		·284		·273	
28. Angle formed by the arch of the pubes, approximately	90°		90°			

are short. Whilst the femora of all the three skeletons are as nearly as may be of equal length, the tibiæ of the Aïno woman are exceedingly short, and her whole lower extremity is short. At the same time, the bones of this extremity are disproportionately thick.

II. In attempting to describe the three Aïno skulls of men, we are desirous as much as possible to avail ourselves, for a perfect comprehension of their peculiarities, of all other information of a comparative nature that we know of. We can only hope to attain a moderate degree of success, and even this will be dubious and fleeting, unless aided by good artistic illustrations. One male Aïno skull has already been described by an accomplished craniologist, and full measurements of it given, by Mr. George Busk, who supplemented these by adding, side by side, those of an "English cranium of the same rather unusual length."* To avail ourselves to the utmost of these data, we will measure the present series of skulls *according to Mr. Busk's method*, and arrange the whole in a table, with the addition of the reduction of the measurements, as accurately as possible, from English inches to millimètres. Mr. Busk's English skull occupies the first column, his Aïno skull the second, and the three other Aïno skulls follow consecutively. It should be noted that the whole are believed to be the skulls of men. The internal capacities of the three last crania have been added, in cubic inches, as well as cubic centimètres.

TABLE II.—MEASUREMENTS, ETC., OF AN ENGLISH AND FOUR AÏNO CRANIA.

The internal capacity of the three Aïno skulls yields an average of 1470 centimètres. By the reduction of this capacity to ounces weight of brain, making due allowance for the weight of the fluids and the membranes, we acquire a mean weight of brain in these Aïno crania of 45·90 ounces avoirdupois, or 1301 grammes. This is a brain-weight considerably exceeding that of the aboriginal races of India and Ceylon, that of all the races of the plains of India, both Hindoos and Mussulmans; and is only paralleled among the peoples of Asia, by the races of the

* *Transactions of the Ethnological Society of London* (New Series) vol. vi.

TABLE II.—MEASUREMENTS, ETC., OF AN ENGLISH AND FOUR AÏNO CRANIA.

	English.		Busk's Aïno.		Aïno, No. 1457, æt. c. 30.		Aïno, No. 1458, æt. c. 45.		Aïno, No. 1459, æt. c. 20.	
	Inches.	Milim.	Inches.	Milim.	Inches.	Milim.	Inches.	Milim.	Inches.	Milim.
1. Length	7·8	198	7·8	198	7·1	180	7·1	180	7·1	180
2. Breadth	5·8	147	5·5	140	5·45	138	5·6	143	5·5	140
3. Height	5·8	147	5·7	145	5·4	138	5·4	137	4·9	124
4. Least frontal width	4·1	104	3·9	99	3·85	97	3·8	96	3·8	96
5. Greatest „ „	4·7	119	4·4	112	4·7	119	4·7	118	4·4	112
6. Parietal „ „	5·3	135	5·5	140	5·3	135	5·4	136	5·0	127
7. Occipital „ „	5·0	127	4·6	117	4·5	114	4·4	111	4·6	117
8. Zygomatic „ „	5·4	137	5·6	142	5·1	130	5·3	134	5·5	140
9. Frontal radius	4·6	112	5·0	127	4·65	113	4·5	114	4·3	109
10. Vertical „	4·9	124	5·0	127	4·8	122	4·7	119	4·35	110
11. Parietal „	5·0	127	5·2	132	4·9	124	4·75	120	4·4	112
12. Occipital „	4·65	117	4·5	114	4·45	113	4·4	112	4·0	101
13. Maxillary „	4·15	105	4·2	106	3·6	91	4·0	101	3·7	94
14. Fronto-nasal „	4·0	101	4·1	104	3·5	89	3·7	94	3·5	89
15. Circumference	21·6	547	21·6	547	20·3	515	20·7	523	20·2	513
16. Longitudinal arc	15·4	390	15·8	400	14·6	370	14·7	372	14·0	355
17. *a.* „ frontal ditto	5·0	127	5·3	135	4·6	117	5·1	130	4·9	124
18. *b.* „ parietal „	5·4	137	4·7	119	5·0	127	...	...	4·6	112
19. *c.* „ occipital „	5·0	127	4·8	122	5·0	127	...	...	4·5	114
20. Frontal transverse „	12·2	309	12·8	323	12·0	304	12·2	309	11·6	294
21. Vertical „ „	13·0	329	13·5	342	13·0	329	12·9	327	12·0	304
22. Parietal „ „	13·7	347	14·2	360	13·4	340	13·6	345	12·5	317
23. Occipital „ „	12·4	314	12·2	309	11·5	292	13·0	329	11·0	279
24. Cephalic Index, latitudinal	·745		·705		·767		·788		·774	
25. „ „ altitudinal	·745		·730		·760		·760		·690	
26. Gnathic „	·15		.1		·1		·3		·2	
					cub. in.	cub. centim.	cub. in.	cub. centim.	cub. in.	cub. centim.
27. Internal capacity	...		...		93·0	1524	89·9	1473	86·3	1414

Himalayas, the Siamese, the Chinese, and the Burmese. It somewhat exceeds the mean brain-weight of Asiatic races in general.

After this table, which gives the whole of the necessary measurements of the series of male skulls, we will endeavour to indicate with some care those peculiarities observed in each individual cranium that may be worth notice.

No. 1457: this is the cranium of a man about thirty years of age. The cheek depressions are unusually deep, and the nasal bones more elevated than common, so as to present an aquiline nose. The frontal suture exhibits all its serrations perfectly from one end to the other. The right frontal bone presents a slight depression just above the edge of the orbit at its inner portion, most likely the seat of some early injury. The left spheno-parietal suture is occupied by a triangular triquetral bone. There is not one in the right. The teeth are all in their places, except two, which have dropped out accidentally, and are quite sound. They are scarcely at all worn, and their condition proves that the Aïnos exercise much more care in avoiding the incorporation of sand in their fish, in the process of drying, than the aboriginal tribes of North America.

No. 1458 is a more massive skull than the last. The nose is decidedly less prominent, still the nasal orifice is not wide. The supraciliary protuberances are marked, and the forehead recedent. The teeth are rather small. Although apparently not more than from forty to fifty years of age, the sutures are much ossified. The course of the sagittal can with difficulty be traced at all. All the central portion of the lambdoidal is equally obliterated. And the whole of the coronal suture, from one alisphenoid to the other, has experienced the influence of ossification, although it is not obliterated. The occipital bone presents a paramastoid process on each side.

In No. 1459 the two upper wisdom-teeth, although cut, have not come into use. The lower ones have just come into use. Yet the spheno-basilary synchondrosis is perfectly ossified. The age must be somewhere near twenty years. The narrow nasal bones are united by an internasal suture, which is not straight, but takes a sigmoid course. The nasal orifice is

narrow. The nose rather flat. The calvarium is well filled out and smooth. There is some doubt whether this may not be the skull of a young woman.

We have not introduced the cranium of the woman's skeleton into our table of measurements, on account of the sex. And the only remark that needs to be made upon it is that it exhibits all the feminine peculiarities in beautiful proportions, so that it is scarcely to be distinguished from the fine and delicate skull of an European woman.

Having given this brief description of the skeleton and skulls, we proceed to say something about the other peculiarities of the Aïnos observed by voyagers, after some mention of their funeral customs.

Many voyagers speak of the mode in which some tribes of the people of north-eastern Asiatic countries dispose of their dead. When among the Orotchys of the continent, La Pérouse found everywhere numerous tombs. He says, that the bodies of the poorer people were exposed upon biers in the open air, under a sort of canopy supported by posts about four feet high. They all had their bows and arrows, their nets, and some morsels of stuffs placed around their monuments. The bodies of persons of more elevated position in the tribe were placed in more imposing tombs. In one of the fine plates to *La Pérouse's Voyage*, the tombs they met with in the Bay of Castries are depicted.* And the report of Siebold is to the same effect:—"Bodies of the rich receive honours of a different kind; they are embalmed, filled with odoriferous herbs, and dried during a year, then placed in a sepulchre, where they are annually visited by their relatives."† It is well known that the Aïnos in Yesso entertain great respect for the dead. There is every reason to believe that the body of the Aïno woman had been carefully dried, after being placed in the bent position with the knees drawn close to the chin, a funeral dress put on, and then it was placed in a sort of basket-work double box or case, formed like those of the Japanese, one to slip within the

* *Atlas du Voyage de La Pérouse*, Planche, No. 53, fol. 1797.

† Siebold, *Mœurs et usages des Aïnos*, as quoted in Prichard, *Researches into the Physical History of Mankind*, vol. iv, p. 456.

other. The dress was made wholly of the same material, a thin, coarse, white cotton cloth, unornamented and one fold in thickness. A piece of the web of this cloth, which was about twelve inches wide, was passed across the abdomen and tied with a strip round the loins. A chemise open before, and reaching to the thighs, with short wide sleeves, was placed on the back; a cap upon the head; and something like gloves (all of the same cotton cloth) upon the arms, tied above the elbows, and like stockings upon the legs, tied above the calves. The head had been closely shaved. It is said that the Aïnos in the Island of Yesso have adopted this practice from the Japanese.

The *Aïnos*, which term means *men* in their own language, are an aboriginal people inhabiting the Island of Yesso, in Japan, and the Island of Saghalien to the north of it.* The Aïnos are also said to inhabit a part of the continent near the mouth of the Amur, and likewise the Kurile Isles. It is very likely that a better knowledge of these remote people will show that the true Aïnos are not so extended. La Pérouse, in his first voyage, sailed from Japan between the continent and Saghalien, in the summer of 1787. It might be said that he ascertained that Saghalien, or Tchoka, was an island, although he did not sail northwards quite through the strait separating it from the continent of Asia. In this part the strait is shallow and greatly overgrown with *fuci*. On the 12th of July La Pérouse had a most interesting communication with the inhabitants on the west, or Asiatic coast of the strait; but it was not till he had sailed to the southern extremity of Tchoka, or Saghalien, at Cape Crillon, that he received the islanders on board his ship. They soon became familiar, seated themselves on the deck, and smoked their pipes. He describes them as of good figure, and with regular traits of countenance. They were

* *Saghalien anga hata, i. e.*, "Rock in the mouth of the Black River", the Saghalien in Ainur. This is the explanation in the maps of the Jesuit missionaries. The island is now called Saghalien by the Russians. La Pérouse ascertained that its native name was *Tchoka*. It has also been denominated *Oku-Jesso*, "High or North Jesso", as it is only separated from Jesso by the Strait of La Pérouse; other names are *Karafto* and *Tarakai*.

stoutly built, and resembled vigorous men. Their beards descended to their breasts, and their arms, necks, and backs were covered with hair. He adds, that he makes this remark because it is a general character: "for we easily find in Europe many individuals as hairy as these islanders.† La Pérouse does not give countenance to that excessive hairiness, which is attributed to them by the Japanese and some voyagers.

It will be well to add, that the Russian circumnavigator, Von Krusenstern, says positively that the inhabitants of the northern end of the island of Yesso, as well as those of the southern end of Tchoka, or Saghalien, both name themselves Aïnos, and in stature, looks, and speech prove themselves to be only one people.

1. There are certain questions which deserve to be carefully examined. *The hairiness of the Aïnos* is one of them. They have had conferred upon them the name of "the hairy men of Yesso", and both Chinese and Japanese writers allude to this peculiarity. The Japanese represent them as barbarians in an eminent measure, and call them "Morin", explained by Klaproth as "Hairy bodies". They have also been named "Hairy Kuriles". Still, the more instructed Japanese do the Aïnos greater justice. In a drawing of an Aïno man made by Syo-da Sabon-ro, English and French interpreter of the Embassy from the Tycoon of Japan to Paris, in 1864, he is represented as having long, straggling locks falling down on each side of his head, and a rough beard of no very unusual length. Captain Broughton, whose voyage was from 1795 to 1798, reported that their bodies were almost covered with long, black hair, and that the same was to be seen in some young children. Von Krusenstern testified, from an examination of some Aïnos in the north of Yesso, that he found them, with the exception of their bushy beards and the hair on their faces, as smooth as other people. In the great Bay or Gulf of Amiwa, at the south of the Island of Saghalien, he induced several to uncover their bodies; and says, "We were convinced to a certainty that the greater part of the Aïnos have no more hair on their bodies than is to be

* *Voyage*, tome iii, p. 86.

found on those of many Europeans." He speaks of "the greater part", because in Mordwinoff Bay he had met with a child, only eight years old, with his body entirely covered with hair; although his parents and several other adult persons in the same place were not more hairy than Europeans. Hence Von Krusenstern declares the extreme hairiness of the Aïnos to be a fable, or exaggerated.* Such is also the testimony of Lieutenant A. W. Habersham, of the U.S. Navy. His account is deserving of quotation at length. "The hairy endowments of these people are by no means so extensive as some early writers lead one to suppose. As a general rule, they shave the front of the head *à la Japonnaise*, and though the remaining hair is undoubtedly very thick and coarse, yet it is also very straight, and owes its bushy appearance to the simple fact of constant scratching and seldom combing. The remaining hair they part in the middle, and allow to grow within an inch of the shoulder. The prevailing hue is black, but it often possesses a brownish cast, and these exceptions cannot be owing to the sun, as it is but reasonable to suppose that they suffer a like exposure from infancy up. Like the hair, their beard is bushy, and from the same causes. It is generally black, but often brownish, and seldom exceeds five or six inches in length. I only saw one case where it reached more than half way to the waist; and here the owner was evidently proud of its great length, as he had it twisted into innumerable small ringlets, well greased, and kept in something like order. His *hair*, however, was as bushy as that of any other. As this individual was evidently the most 'hairy Kurile' of the party, we selected him as the one most likely to substantiate the assertion of Broughton, in regard to 'their bodies being almost universally covered with long, black hair'. He readily bared his arms and shoulders for inspection, and (if I except a tuft of hair on each shoulder-blade, of the size of one's hand) we found his body to be no more hairy than that of several of our own men. The existence of these two tufts of hair caused us to examine several others, which examination established his as

* Ritter, s. 477.

an isolated case."* This fully confirms the statement of Von Krusenstern. They wear the hair of their heads and their beards, usually their only covering to this part of their bodies, long and flowing, as a defence against the climate in which they dwell, which at certain seasons is sufficiently severe; and it is probable that at times they are unusually hairy.

To return to the account given by La Pérouse of his visitors in the Bay of Crillon. He says, he believed their stature to be the middle height, about an inch less than that of the French; but speaks with some doubt, from the just proportion of the parts of their bodies, adding,—their different muscles being strongly pronounced made them appear in general form fine men.

2. In this place it may be desirable to determine as far as we can *the stature of the Aïnos*. We have seen what La Pérouse says upon the subject. Von Krusenstein affirms that they are of middle, almost equal stature, rising at most to five feet two inches. If this were Paris measure, it would be equal to five feet six inches, or sixty-six inches English; *i.e.*, 1672 mm. Syoda Saburo, the Japanese interpreter, says, they are in general neither very tall nor very little, but of good proportions. Lieut. Habersham's testimony is, that "though undoubtedly below the middle height as a general rule, I still saw several who would be called quite large in any country; and though the average height be not more than 'five feet two or four inches', they make up the difference in an abundance of muscle".† Perhaps we may be able to procure more definite results as to the stature of the Aïnos. The woman's skeleton was, as already stated, five feet or sixty inches; *i.e.*, 1522 mm. in height. Two pairs of femora, probably both belonging to males, were 16·9 inches in length, another femur 15·8 inches, and a sixth was 15·5 inches in length. By applying Dr. Humphry's rule to the longest femora, we obtain a stature of five feet two inches, or sixty-two inches, *i.e.*, 1573 mm.; and to the shortest femur, we obtain a stature of only four feet eight and

* *Nott and Gliddon's Indigenous Races of the Earth*, 1857, p. 620.

† *Loc. cit.*, p. 620.

three-tenths inches, or 56·3 inches; *i.e.*, 1428 mm. So that there is good reason to regard the Aïnos of Yesso as a short people, probably averaging not more than, if so much as, five feet two inches, or 1573 mm., in stature. Whether the disproportionate shortness of the leg-bones of our Aïno woman's skeleton is a race peculiarity, it is not quite possible to decide definitively. It does, however, seem to be very likely. Among the other tibiæ measured, one pair, probably belonging to one of the men to whom the longest femora appertained, were 13·3 inches, or 337 mm., in length. A single tibia was thirteen inches, or 329 mm., in length, and a fourth only 12·7 inches, or 319 mm. So that there is considerable probability that shortness of the leg-bones is a common feature among the Aïnos.

3. La Pérouse says *the colour of his Aïno* visitors was as dark as that of Algerines, or of other people of the coast of Barbary. Broughton says, they are of a light copper-colour; but Von Krusenstern asserts that they are almost black. Lieut. Habersham speaks more definitely. "We saw several hundred men, women, and children, and these were all of *a dark brownish-black*, with one exception; which exception was a male adult, strongly suspected of being a half-breed."* This may be considered to be quite confirmatory of Von Krusenstern's observation, and conclusive as to their dark colour; although inhabiting a country in which the mountains are covered with snow throughout the year. It is believed that the dried body of the woman was of a dark-brown colour.

The Aïnos are well known to hunt the bear, although their food consists principally of fish, salmon especially. Their drink is snow-water. They are confidently said to carry away the she bear's cubs, and to tame them. There is even authority for the assertion that they ride upon these young bears. And Von Krusenstern positively affirms that, in every house in the south of the Island of Saghalien, was to be observed a young bear, which was reared there, and had its place in the corner of the hut. He adds, that notwithstanding he was the most restless and noisy inmate of the house, yet none of the owners

* *Loc. cit.*, p. 621.

differs not only from the European, but from all other types of skull with which I am acquainted in the greatly-advanced position of the jugular process of the occipital bone." The measurements we have given show that the zygomatic arches are not so widely divergent in our examples as in that of Mr. Busk, hence the pheno-zygous character is not so apparent, unless it be in No. 1459. And the advanced position of the jugular processes of the occipital bone is not seen in any of our examples, unless in No. 1457. They are not to be taken as exactly of the same form as European crania; but there is no striking divergence from Western European types, which is at once obvious. Still these skulls of Aïnos, as already said, are not to be taken as exactly of the same form as the skulls of Europeans; although the differences may not be so striking and at once obvious. They are certainly much more like the skulls of Europeans than those of any other race we know of in proximity with the Aïnos. As before-mentioned, they do not present that interjugal breadth, nor that flatness of face which belong to those races called Mongolian. They have a moderately well-developed and upright forehead (No. 1458 least so), which is quite European. The chin is prominent and well-rounded. The nasal orifice is rather narrow, especially in No. 1459. But there is an appearance about the face, and in the long, narrow nasal bones which distinguishes them from Europeans. These last are placed upon rather wide nasal processes of the superior maxillaries, and, except in No. 1457, make very little prominence. So that, nevertheless, upon the whole it may be said that, by minute examination, their diversity of features from Europeans stands confessed.

It is not easy to compare these skulls of Aïnos with those of the races which come into proximity with them. All specimens of such crania are at present extremely rare. Of skulls of Kurile Islanders, or of the tribes about the mouth of the Amur none are known. Those of Japanese differ decidedly from those of Aïnos. Von Kotzebue, in 1817, sailed all along the eastern shores of the Island of Saghalien, but a want of access to his voyage prevents our obtaining any information from that source. In the Atlas of Choris there are two figures

of a cranium of an inhabitant of the Aleutian Islands, which are on about the same parallel as Saghalien, only considerably to the east, and beyond the southern extremity of Kamschatka. This skull is not very accurately depicted, but its form and features are quite distinct enough to show that it bears no resemblance whatever to our Aïnos. It is a very peculiar cranium, with an exceedingly recedent forehead, short face, and much lateral development of the calvarium — pre-eminently non-European.

2. We next come to *the moral deportment of the Aïnos*, of which all observers agree in speaking favourably. La Pérouse did not find the inhabitants of the Bay of Crillon to manifest the extraordinary generosity of the Orotchys of the Bay of Castries, on the opposite or continental coast of Asia. But, he says, "their manners were grave, and their thanks expressed by dignified movements." Von Krusenstern says, their women obtain by their coal-black hair hanging down their necks, the dark colour of their faces, their lips stained with blue, tatooed hands and great dirt, a sinister appearance; although their behaviour is very modest, and in every expression betrays something dignified. He says, goodness of heart is expressed in every portrait of them that the skilful Tilesius painted. Instead of the greediness and rapacity, which are the general vices of the South Sea Islanders, they present much liberality and friendliness.

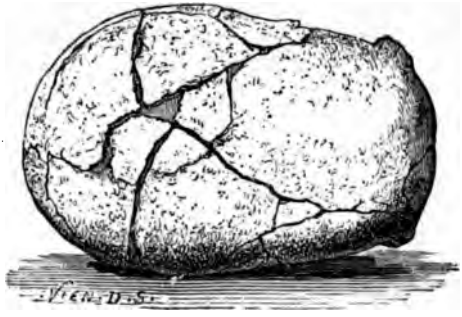
They are a mild people, and in this respect they stand in much contrast with many of the aboriginal races of the earth. It seems probable that the fine development of the brain in the Aïnos is connected with the display of the virtues of humanity. Their respect for the aged, and their treatment of women are vastly superior to those of savage nations in general. They avoid in their marriages too near relationship. This is often the practical wisdom of aboriginal people. They marry one wife, treat her as a helpmeet, not as a drudge, and allow her to exercise her own peculiar gentle sway over their minds. The testimony of Lieut. Habersham, after he has made allowance for some of the failings of the Aïnos, is very decided. His words are:—"The Aïnos are unpleasantly re-

markable as a people in two respects; viz., the primitive nature of their costume, and their extreme filthiness of person. I doubt if an Aïno *ever* washes; hence the existence of vermin in everything that pertains to them, as well as a great variety of cutaneous diseases, for which they appear to have few or no remedies. There is another side to the picture, however, and it is a bright one. Their moral and social qualities, as exhibited both in their intercourse with each other and with strangers, are beautiful to behold."*

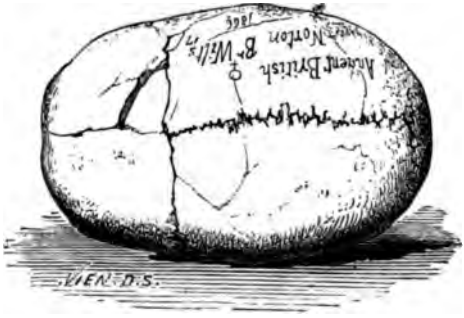
These rude and simple people, of such great interest in many respects in an ethnological point of view, have been known in an imperfect manner to western Europeans since the middle of the last century. The Chinese and the Japanese geographers may for a longer period have been somewhat better acquainted with them, although the accounts collected by Ritter from these sources are all dated within the last hundred years. The Japanese geographer Rinsifée's discoveries appear to have been made only within two years before those of La Pérouse. And the notices quoted by Ritter from the great geography of the Chinese Empire, are from the edition of 1818. That the Aïnos have been the subjects of great exaggeration and of fable has been rendered quite apparent. Further observation reduces the statements respecting them to their true dimensions, and exhibits them as a peculiar people endowed with many good qualities. The very rare opportunity which has fallen in our way to add to the knowledge of their physical organisation has been embraced with pleasure, and it is hoped turned to some useful account.

* *Op. cit.*, p. 621.

1.—Female Skull (235), from a Long Barrow at Tilshead (Old Ditch), South Wilts.—(B–I, '68.)



2.—Male Skull (233), from a Long Barrow at Figheldean, South Wilts.—(B–I, '66.)

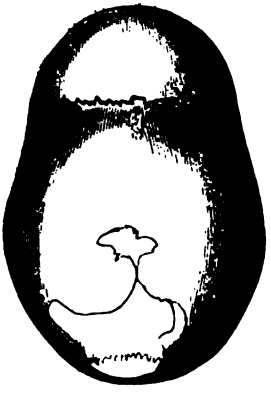


3.—Female Skull (251), from a Long Barrow at Norton Bavant, South Wilts.—(B–I, '64.)

ANCIENT BRITISH.—FROM LONG BARROWS IN WILTSHIRE.

Lateral view.

Frontal view.



Vertical view.

Synostotic Male Skull (210) from Bowlsbarrow, South Wilts.—(B-I, '67.)

III.—*Further Researches and Observations on the Two Principal Forms of Ancient British Skulls.* By JOHN THURNAM, M.D., F.S.A., F.A.S.L.

IN the first volume of the Memoirs of the Anthropological Society,* I have described, at length, two types of skulls from the grave-mounds of the ancient Britons, which are strongly contrasted the one from the other. The first, and, as I believe, the earliest in time, are very remarkable for their "long-drawn-out" (*dolichocephalic*) and narrow (*stenocephalic*) form; and have hitherto been principally found in the long barrows of the south-west of England, and especially in those of the counties of Wilts and Gloucester. The second are characterised by their more or less broad and short form, which brings them within the *brachycephalic* and *eurycephalic* categories of technical craniologists; and are yielded by the circular barrows of the pre-Roman period, which are spread extensively over nearly the whole of this island.

ARCHÆOLOGICAL INFERENCES.

The *long barrows*, in accordance with the geological character of the districts in which they occur, are either simple tumuli of earth, chalk, rubble, and flints, as in South Wilts and Dorsetshire; or they contain more or less elaborately built-up chambers, galleries, or cists of large stones, as in North Wilts and Gloucestershire. Whether, however, they enclose megalithic chambers or not, the sepulchral deposits are almost invariably found at or near the broad and high end of the tumulus, which is generally directed towards the east. In no case have the primary interments yielded objects of metal, whether bronze or iron; but, in some instances, implements or weapons of bone

* "On the Two Principal Forms of Ancient British and Gaulish Skulls." (*Memoirs Anthrop. Soc.*, 1865, i, 120-168; 459-519. With Appendix of Tables and Plates.)

and flint, and especially well-chipped leaf-shaped arrow-heads; and also perhaps (as at Uley), axe-heads of flint and green stone, both polished, have been found in them.* I therefore think we do not err in attributing this form of tumulus, as it occurs in this south-west part of England, to the *neolithic* age, and to a period when the burning of the dead, though not unknown, was not a received or favourite method of disposing of their remains.

The *round barrows*, whether simply conoid or bowl-shaped, or of the more elaborate bell and disc forms, are very much more numerous than the long barrows of the same districts. They much more frequently cover interments after cremation than by simple inhumation,— in the proportion indeed, of at least three of the former to one of the latter. As, however, the objects found with the burnt bones and with the entire skeletons in this class of barrows do not differ in character, but, in addition to implements and weapons of stone, including beautifully barbed arrow-heads of flint, not unfrequently comprise weapons and implements of bronze, and the finer and more decorated sorts of ancient British *fictilia* — the so-called "drinking" and "incense cups"—we may safely conclude that all are of the same bronze age,† during which, in

* Many of the primary interments in the long barrows have yielded rude flakes, knives, and scrapers, as well as large globular nodules of flint, weighing from one to four pounds, which have obviously been utilised. (*Archæologia*, xxxviii, 416.) In one case, there was a sort of natural bludgeon of flint, from one end of which flakes had been detached. (*Mem. Anthrop. Soc.*, i, 142, fig. 7.) In three of the long barrows, one simple and two megalithic, the delicate, leaf-shaped arrow-heads referred to in the text have been met with. (*Proc. Soc. Ant.*, second series, iii, 168, 1865.)

† Objects of *iron* have only in very rare instances (and those reported are not always free from doubt), been found in the round barrows; yet, the people who raised these grave-mounds were no doubt really in possession of that metal, as well as *bronze*. Iron, however, was scarce, and its use probably very much restricted. This accords with the statement of Cæsar as to the Britons of his day,—"ferri exigua est copia; æræ utuntur importato." (*B. G.*, v, 12.) The age was strictly one of *bronze and iron transition*.

The archæological details as to the different forms of ancient British tumuli in the south-western counties of England, are given in papers, by the author of this Memoir, communicated to the Society of Antiquaries of London, in the years 1867 and 1868, for publication in the *Archæologia*.

this country, cremation, though not the exclusive, was the favourite method of disposal of the remains of the dead.

Anthropological Inferences.

The conclusion at which I arrived, in the memoir referred to, as to the strongly contrasted head-forms associated with the two classes of grave-mounds now briefly described, was that they are to be assigned to two distinct peoples. The brachycephalous skulls, of the round barrows and bronze age, appeared to me to be clearly attributable to the Belgic Britons of the time of Julius and of the ages immediately antecedent and subsequent; who, as we know, migrated to this island from Gaul. The dolichocephalous skulls, of the long barrows and stone age, I assigned, with at least equal confidence, to the most ancient inhabitants, who were conquered and displaced by the Belgic invaders, and are described by Cæsar, under the name of *Interiores Britanni*, as forming the aboriginal population.* We are not without historical grounds for regarding this last population as of quite diverse origin from the former, and for regarding it as Iberian, or at least as owning a common parentage with the Iberians.

The general connexion of the two different skull-forms with two differing forms of tumulus, appeared to me sufficiently curious to be summed up in a convenient antithetic formula, thus:—"*Long barrows, long skulls; round barrows, round or short skulls.*" At the same time, I was quite aware of the existence of apparent exceptions to this proposition, and was fully prepared for greater ones than had then been observed.

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* "Britanniæ pars interior ab iis incolitur, quos natos in insula ipsa memoria proditum dicunt. Maritima pars ab iis, qui prædæ ac belli inferendi causa ex Belgis transierant; qui omnes fere iis nominibus civitatum appellantur, quibus orti ex civitatibus eo pervenerunt, et bello illato ibi remanserunt atque agros colere cœperunt. . . . Ex his omnibus longe sunt humanissimi, qui Cantium incolunt, quæ regio est maritima omnis, neque multum a Gallica differunt consuetudine. Interiores plerique frumenta non serunt, sed lacte et carne vivunt, pellibusque sunt vestiti." (*B. G.*, v, 12, 14). Whilst it is seen that the Belgic tribes near the coast were comparatively civilised agriculturists, the people of the interior were much less cultivated and still in the hunting and pastoral condition.

As to the round barrows, I expressly remarked that it was *evident that, unless the earlier race had been suddenly exterminated by the succeeding one, a mixture of interments and of the two types was to be expected.**

Objections Met.

It is only for the first part of my proposition, viz.—*Long barrows, long skulls,* that I lay any special claim as a discoverer or original observer. I believe I have established, for this part of England, the connexion, apparently uniform, between long barrows and dolichocephalic skulls. I have now opened more than twenty of those remarkable grave-mounds, and not one of them has yet yielded, in the primary place of interment, a brachycephalic skull. As to the second part of the proposition, viz.—*Round barrows, round skulls,* I claim little more than to have formulated, not so much my own original observations, which under this head are not very extensive, but rather the common experience of all British craniologists; among whom I reckon Prof. D. D. Wilson, the late Mr. Bateman, Mr. G. Tate, my friend Mr. Greenwell, and my colleague in the production of *Crania Britannica,* Dr. J. Barnard Davis. All of these hold that the prevailing ancient British skull-type, and consequently that of the round barrows, is brachycephalous.

Objections to this, the second proposition of my formula, have recently been adduced, founded on nine imperfect skulls, received from round barrows in Dorsetshire, and presented to the Anthropological Society by Mr. Shipp of Blandford.† Even if all these skulls were relevant to the question, it may be safely asserted that a much larger amount of evidence than they comprise would be required to invalidate the proposition before us, in the sense in which it is held. I have particularly examined and measured these nine skulls, and my measurements do not differ materially from those by Mr. C. C. Blake, though I obtain from them an average breadth-index of ·72, as against

* *Mem. Anthrop. Soc.*, i, 128. Separate Copy, p. 9. I also referred to the probable "production of a hybrid population with a cranial form intermediate to the two others". *Ibid.*, i, 150. Separate Copy, p. 31.

† *Anthrop. Review*, 1866, iv, 393.

one of ·71.* There is, however, no doubt that this small series is much more dolichocephalous than any yet published as from round barrows, and that the mean breadth-index approximates closely to that of the true long-barrow skulls. The two first alone (Nos. 1 and 2), are of the usual round barrow type, and have a breadth-index of ·81 and ·80. The other seven vary from ·67 to ·74 (average ·70⁶), which are dolichocephalous and long-barrow breadth-indices.

Upon looking at the history of these skulls, as deducible from Mr. Shipp's memorandum, from a letter with which he has favoured me, as well as from the narrative of the opening of most of the barrows in which they were found, given in Mr. Warne's recent work, *The Celtic Tumuli of Dorset*, I see great reason to doubt whether, of the entire number, more than one was derived from a really *primary interment* in a circular barrow of the British period. Four or five are, indeed, avowedly from "superficial" or *secondary* deposits. Another (No. 8), is from a cemetery of the Roman period at Spettisbury,† and from no round barrow at all. Another (No. 9), is considerably affected by posthumous lateral flattening. Two others (Nos. 4 and 5), are from an interment, the character of which, as an ancient British barrow, may be doubted: consisting as it did of a slight "swelling of the turf on Kingston Down, barely twelve inches above the surrounding surface", with a layer of flints covering seven skeletons lying side by side and east and west, in a shallow grave one foot deep.‡ Both these skulls have a quite recent appearance, and retain decided traces of the ani-

* There are really *eleven* skulls and calvaria, and *ten* (excluding "No. 10"), capable of being measured. The last, (Nos. 11 and 12 of Mr. Shipp's Memorandum, forming one specimen) has a breadth-index of ·73, and its addition to the series does not affect the mean *breadth-index*, which I still make ·72. The mean *height-index* of the ten skulls is ·74.

† See *Proc. Soc. Antiq.*, iv, 188.

‡ Warne, *Celtic Tumuli of Dorset* (Part 2); *Kingston Down Tumulus, Twelve*, p. 11. In my observations in the text, I assume the genuineness of these nine or ten skulls. It must not be forgotten, however, that they bear no labels inscribed at the time of their discovery; and that when presented to the Anthropological Society, they had been in Mr. Shipp's possession for a period of twenty years. The circumstances are not favourable to their correct identification; though this is certainly possible.

mal oil of the bones, such as I have never seen in truly ancient British skulls.

As regards skulls from secondary interments, they require to be entirely eliminated from the general inquiry, as we can seldom say to what period they belong. Many, perhaps the majority, are Anglo-Saxon, and some may be of the Roman period. On the other hand, it is quite possible that some are pre-Roman and ancient British; but proof of this is certainly not afforded in the meagre details we have of their exhumation in this instance.

I am, however, quite prepared for the announcement that, in some parts of England, there are round barrows, the primary interments in which yield elongate skulls of the long barrow type. And, though no series of such skulls has yet been produced, I should by no means be surprised to meet with them in some of those districts in which, it may be from local causes, the immigrant brachycephalous race did not at once extend itself; though it may have communicated its fashion of erecting round rather than long barrows over the dead. Such a district may possibly have been Dorsetshire. Wiltshire was an important centre of the Belgæ; but the neighbouring Dorsetshire, as I have shown elsewhere, and without reference to the present inquiry, has no claim to be considered as settled by the Belgic invaders.* A comparison of the objects found in the circular barrows of the two counties conclusively shows that the Durotriges were a much poorer and less cultivated people than their neighbours the Belgæ. It is quite possible, therefore, that they may turn out to have been a tribe of the primitive dolichocephali, as we may conclude, on historical grounds, the Silures and other western tribes were, even in the Roman period.

I here freely admit that Mr. Greenwell's excavations, during the autumns of 1866 and 1867, seem to show that in some of the circular barrows of the North and East Ridings of Yorkshire, the primary interments were really those of a dolichoce-

* *Crania Britannica* (Decade 5). Description of a skull from Ballard Down, Dorset. (Pl. 45, xxxiii, p. 1, 4.)

phalic people not distinguishable from those of the long barrows; whilst the secondary interments, though evidently ancient British, were still more certainly brachycephalic.* These facts, though for this particular part of England, opposed to the naked proposition, "round barrows, round skulls", are still in favour of the more important inference as to the presence of two altogether distinct races in Britain in pre-Roman times; one of whom, the earliest in order of time, was dolichocephalic, and the other brachycephalic. This very part of England, North-East Yorkshire, is indeed one in which it is highly probable that the two races were brought into contact without at once becoming mixed. The "Wolds" of the East Riding formed almost certainly the boundary between the Parisii of the southern part of the East Riding and the Brigantes of the rest of the present Yorkshire. There are also good grounds for believing that the former were a more civilised tribe than the latter, and that they were immigrants of Belgic or Gaulish origin; whilst the Brigantes probably belonged to the tribes who are called aborigines of the interior by Cæsar.†

Further Evidence.

My present principal object, however, is that of reviewing the whole subject, in the light of the additional researches and more extended data, acquired since my former papers were written.

Round Skulls from the Round Barrows.

I will commence with the minor and less important proposition of the two; viz., the connexion of brachycephalous skulls

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* This I take from Mr. Greenwell's report, and from letters with which he has favoured me; not having had an opportunity of carefully examining the skulls themselves, the measurements of which have not yet been published.

† This point was worked out many years ago, quite independently of the question now under discussion. See "Description of Ancient British Skull from Arras E. R. Yorkshire," *Cran. Brit.*, Plates 6 and 7, XII, p. 5, decade 2, 1857. The skull here figured and described has a breadth-index of ·74, and is, therefore, not brachycephalic. It has, however, no relations with the long-barrow skulls, as its macrognathic character sufficiently declares. Like one or two other skulls in my collection, it is an exceptional and aberrant instance of the brachycephalous British skull form.

with the circular British barrows; or *Round barrows, round skulls.*

As to this, I relied chiefly on the data brought together in the descriptions, plates, and tables of measurements, in *Crania Britannica.* The large Table II of that work, with measurements of one hundred and eleven ancient British skulls,* about half of which may be from round barrows, was not completed by my former colleague, when my former memoir was written. The data in that table, as in the entire work, were brought together by my colleague and myself, without any reference to the views to be deduced from them; but solely on the grounds of the due authentication of the skulls, and of their fitness, as regards preservation, for being engraved, described, and measured.

In the complete work, *Crania Britannica,* there are descriptions and plates of twenty-five skulls from round barrows in all parts of Great Britain;† one only of this number being regarded as the skull of a woman. These twenty-five skulls have breadth-indices which range between ·74 and ·86, and have a mean of ·80⁵.

SKULLS FROM ROUND BARROWS IN ALL PARTS OF GREAT BRITAIN, ENGRAVED AND DESCRIBED IN "CRANIA BRITANNICA."—*BREADTH INDEX.*

No. of Skulls.		Range.		Mean.
25.	...	·74 to ·86.	...	·80⁵.

Nine of the twenty-five have a breadth-index of less than ·80; four being oval or orthocephalic (·74-·76), and five subbrachycephalic (·77-·79); sixteen are brachycephalic (·80-·86). *Not one skull is, properly-speaking, dolichocephalic.*

In Table II of *Crania Britannica,* as already pointed out, the measurements of a much larger series of skulls from round barrows are to be found. It will be desirable to exclude those

* *Cran. Brit.,* Table II, p. 242-245.

† *Cran. Brit.* Table I, p. 240-241. The Table comprises thirty-five skulls; but of these, two are from Ireland, five from long barrows, two from graves not covered by barrows, and one is too defective to allow of the breadth-index being calculated. Twenty-one of the twenty-five round barrow-skulls, from this Table, were given in the second part of Table I of the paper, in the *Memoirs of the Anthropological Society,* i, 462.

No.	DERIVATION OF SKULLS.		Probable Age.	I. Cubic Capacity.	II. Circumference.	III. Length.	IV. Breadth	V. Height.	VI. Face. Length.	VII. Face. Breadth.	A. Breadth: Length = 1·00	B. Height: Length = 1·00.
	48 Skulls, supposed to be of Men.											
1	Bowls Barrow, *South Wilts.*	213	50	. .	. .	8·1	5·3	6·1	. .	. .	·65	·75
2	Norton Bavant	250	25	105	21·1	8	5·25p	5·8			·65	·72
	19 Skulls, supposed to be of Women.											
1	Norton Bavant, *South Wilts.*	253	35	. .	. .	8·15	5·2p	5·5	. .	. .	·63	·67
2	Norton Bavant, „	251	18	100	21·9	8·1	5·2p	5·8	. .	. .	·64	·71
3	Tilshead (Old Ditch), „	235	65	97	21·2	7·8	5 3	5·2	4·5	5·1	·68	·66
4	Charlton Abbots, *Gloucestershire.*	B. 2	50	86	20·6	7·4	5·1	5·5	. .	. .	·68	·74
5	Charlton Abbots, „	C. 10	60	. .	20 6	7·5	5·1p	. .	. .	. .	·68	. .
6	Charlton Abbots, „	C. 6	30	86	20·1	7·2	5·1p	5·2	. .	. .	·70	·72
7	Charlton Abbots, „	C. 9	20	. .	. .	7·5	5·3p	. .	. .	. .	·70	. .
8	Littleton Drew, *North Wilts.*	64	17	88	21	7·7	5·4p	5·5	. .	. .	·70	·71
9	Oldbury, „	.....	50	. .	. .	7·4	5·3p	5	. .	. .	·71	·67
10	Charlton Abbots, *Gloucestershire.*	C. 7	40	87	19·9	7·1	5·1p	5·4	. .	. .	·71	·76
11	Charlton Abbots, „	D. 4	7	. .	19·5	7·1	5·2p	4·8	. .	. .	·73	·67
12	Norton Bavant, *South Wilts.*	252	25	77	20 6	7·4	5·4	5·5	. .	. .	·73	·74
13	Uley, *Gloucestershire*	3201	10	96	20·9	7·4	5·5p	5·1	. .	4·2	74	·69
14	Rodmarton, „	165	40	89	20·6	7·4	5·5p	5·5	4·1	4·9	·74	·74
15	Tilshead (East), *South Wilts.*	182	30	. .	21·8	7·7	5·7p	5	4·5	. .	·74	·65
16	Tilshead (East), „	183	20	. .	. .	7·1	5·3p	4·9	. .	. .	·74	·69
17	Oldbury, *North Wilts.*	.....	60	. .	20·8	7·5	5·6p	5·2	. .	. .	·74	·69
18	Charlton Abbots, *Gloucestershire.*	C. 8	60	. .	20	7·2	5·4p	5·6	. .	. .	·75	·77
19	Charlton Abbots, „	C. 2	60	105	20·6	7·2	5 6p	5·6	4 3	5·2	·77	·77
	Average in Inches English.			91	20·6	7·45	5·3	5·3	4·3	4·8	·71	·71
	Average in C. Centim. and Lin. Millimetres.			1491	523	189	134	134	109	122		

TABLE IV.—MEASUREMENTS OF 70 ANCIENT BRITISH SKULLS, FROM ROUND BARROWS; ARRANGED IN THE ASCENDING ORDER OF THE BREADTH-INDEX.

No.	DERIVATION OF SKULLS.		Probable Age.	I. Cubic Capacity.	II. Circumference.	III. Length.	IV. Breadth.	V. Height.	VI. VII. Face. Length.	Face. Breadth.	A. Breadth: Length = 1·00	B. Height: Length = 1·00
	56 Skulls supposed to be of Men.											
1	Arras, *East Riding, Yorkshire.*	Pl. 6	30	98	21·1	7·5	5·6*p*	6	4·9	5·1	·74	·80
2	Kennet Hill, *Wiltshire.*	Pl. 11	60	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
54	Castern, *Staffordshire.*	73	40	. .	20·1	7	6·1*t*	. .	5·2	6·2	·87	. .
55	Rolley Lowe, *Derbyshire.*	49 T	65	. .	21·3	7·2	6·3*p*	. .	4·8	. .	·87	. .
56	Monsal Dale, „	187 T	40	. .	20·8	6·9	6·1*t*	5·6	4·5	5·8	·88	·81
	Average in Inches English.			96	21·1	7·28	5·9	5·6	4·75	5·45	·81	·77
	Average in C. Centim. & Linear Millimetres.			1583	536	185	149	142	121	138		
	14 Skulls supposed to be of Women.											
1	Bee Lowe, *Derbyshire.*	177 T	17	. .	20·8	7·4	5·5*p*	5·4	4·6	. .	·75	·74
2	Parwich, „	161 D	30	85	19·7	7	5·4*p*	5·4	. .	. .	·77	·77
3	Middleton Moor, „	Pl. 35	40	80	20	7·1	5·6*p*	5·5	4·3	5·1	·78	·77
4	Bailey Hill, „	168 C	30	. .	19·6	6·9	5·4*p*	5·4	. .	5·1	·78	·78
5	Hay Top, „	181 T *a*	30	. .	20·7	7·3	5·7*p*	5·7	. .	. .	·78	·78
6	Blake Lowe, *Staffordshire.*	112 T	17	. .	20·2	7	5·6*p*	5·1	4·3	. .	·80	·72
7	Rolley Lowe, *Derbyshire.*	48 T	50	. .	20·6	7	5·8*t*	. .	4·9	. .	·82	. .
8	Three Lowes, *Staffordshire.*	69 T	35	87	19·9	6·8	5·7*t*	5·5	4·3	5·5	·83	·80
9	Rusden Lowe, *Derbyshire.*	128 T	25	. .	19·9	6·8	5·7*p*	5·2	. .	. .	·83	·76
10	Hay Top, „	186 T	60	. .	. .	6·9	5·8*p*	5·3	. .	. .	·83	·77
11	Smerrill Moor, „	231 T	20	. .	19·3	6·5	5·4*p*	5·4	4	5·1	·83	·83
12	Staker Hill, „	192 T	30	. .	20	6·9	5·8*p*	5	4	. .	·84	·72
13	Galley Lowe, „	11 T	70	. .	19·7	6·9	5·8*t*	. .	3·7	. .	·85	. .
14	Hay Top, „	181 T	30	. .	20	6·7	6 *p*	5·4	. .	. .	·89	·80
	Average in Inches English.			84	20	6·9[8]	5·6[8]	5·3[8]	4·2[8]	5·2	·81	·77
	Average in C. Centim. & Linear Millimetres.			1376	508	176	143	136	108	132		

from other parts of England, as to most of which the exact character of the tumulus or grave whence they were derived is not known, and to confine ourselves to those, from the circular barrows of Derbyshire and Staffordshire, which are preserved in the Bateman collection at Youlgrave. These are forty-one in number, of which twenty-eight are supposed to be the skulls of men and thirteen those of women.* All the measurements of this series, I ought to state, are by Dr. Barnard Davis. The results tally remarkably with those obtained for the skulls figured and described in *Crania Britannica*. The forty-one skulls have breadth-indices which range from ·74 to ·89, and have a mean of ·80⁷. *Not one skull is properly speaking dolichocephalic.*

SKULLS FROM ROUND BARROWS IN DERBYSHIRE AND STAFFORDSHIRE IN THE BATEMAN COLLECTION.—*BREADTH-INDEX.*

No. of Skulls.		Range.		Mean.
41.	...	·74 to ·89.	...	·80⁷

I have made numerous excavations in the round barrows of Wiltshire, with the hope of accumulating evidence as to the ancient British skull type of the bronze period in this part of the island. I have not, however, obtained from the primary interments in this class of tumuli, more than nine or ten skulls in a condition susceptible of measurement. Two of these are engraved and described in *Crania Britannica*, and are included in the above first category of twenty-five skulls. Six other skulls and calvaria from barrows near Stonehenge, with a seventh obtained by a friend from a barrow at Ulwell, Dorset, may be added to our data.† The breadth-index is respectively,

* I exclude 152 C (♀, breadth-index ·69) as clearly secondary (*Ten Years' Diggings*, p. 161). I have compared the measurements in Table II, *Cran. Brit.*, with the details in Mr. Bateman's *Vestiges*, and *Ten Years' Diggings*, and especially with the *Descriptive List* of Skulls in the Appendix to the latter work.

† The measurements of four of these seven skulls are given in the second part of Table I in my former paper, *Mem. Anthrop. Soc.*, v. i, p. 462, Nos. 7, 10, 19, and 25. They are repeated in Table II, appended hereto. The three not in the table are Nos. 186, 265, and 266. The former is from an oval barrow, of the round-barrow period. Another skull (No. 254 of my collection), more recently obtained from a round barrow near Bratton, Wilts, is a remarkable

·78, ·79, ·80, ·81, ·84, ·85, and ·87; average, ·82. *Five of the seven are absolutely brachycephalic, and the other two are sub-brachycephalic, and closely approach that form.*

If we combine these three series into one, we obtain seventy skulls; fifty-six of which are presumably those of men, and fourteen of women. The principal measurements of the whole are given in Table II, appended hereto. They constitute the most important data yet obtained, or, we may unfortunately add, likely to be now obtained,* for determining the breadth-index and general cranial type of ancient British skulls from the round barrows. The entire series, in reference to breadth-index, may be thus classed: the first column of figures gives the actual number, the second the per-centage.

Ancient British Round-Barrow Skulls.		Male.		Female.		Both Sexes.	
		Nos.	Proportions.	Nos.	Proportions.	Nos.	Proportions.
I. Dolichocephali.	(· —·70)	...	...	...	...	...	...
Sub-dolichocephali.	(·70—·73)	...	...	...	...	...	...
II. Orthocephali.	(·74—·76)	11	·19⁶	1	·07	12	·17
Sub-brachycephali.	(·77—·79)	10	·18	4	·29	14	·20
III. Brachycephali.	(·80—·89)	35	·62⁵	9	·64	44	·63
		56	1·00	14	1·00	70	1·00

It is seen that these round barrow skulls are essentially brachycephalous. Not a single skull is either dolichocephalic or sub-dolichocephalic, according to my method of classifying skulls by their breadth-index, and which is almost identical with that of Professor Welcker.† A few, 17 per cent. only,

instance of the effect of posthumous distortion, by which a cranium which was clearly sub-brachycephalous (*c.* ·78) has been converted into a pseudo-dolichocephalic one, having a breadth-index of ·70. In another specimen of a female skull (No. 261), being that from the primary interment in a circular barrow on Warminster Down, excavated May 18, 1867, the same strangely transforming effect of posthumous distortion is likewise very apparent. This skull, however, was by nature less brachycephalic.

* The destruction of skulls and other human remains by the generality of barrow-diggers, and especially in Wiltshire at the beginning of this century, by the elder Cunnington and Sir R. C. Hoare, can hardly be too much deplored. The loss to anthropological science is irreparable.

Mr. L. O. Pike's criticism (*The English and their Origin*, p. 160), is met by the publication of Table II, the materials for which were formerly not accessible.

† *Mem. Anthrop. Soc.*, 1865, i, 462, 507, 510. "Two Principal Forms of Ancient British and Gaulish Skulls," (separate copy, pp. 52, 97, 100).

are ovoid or orthocephalic; but so are a certain proportion of the skulls of the most brachycephalous peoples of modern times.

Our round-barrow ancient British skulls are as brachycephalous as those of modern Germans, Slavonians and Mongols. They occupy, indeed, as regards their mean breadth-index, almost exactly the same position as the skulls of those peoples. This is well seen, on reference to the extensive measurements by Professor Welcker, who gives ·79 as the mean breadth-index of the skulls of Little Russians and Finns; ·80 as that of the South Germans, Great Russians and Magyars; and ·81 as that of the Swiss, Slovaks, Calmucks and Tungusians.*

I here confine myself, as regards the round barrow cranial type, to the inferences to be drawn from actual measurements of well authenticated skulls. It would be easy to confirm the view I have arrived at by the opinions and observations of various writers. Mr. Bateman for Derbyshire and Staffordshire, Mr. Greenwell and Mr. Tate for the Northumbrian dis-

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Welcker, *Archiv für Anthrop.*, 1866, i, p. 135. Here is given a most valuable tabular classification of skulls of all peoples, according to their breadth-indices, from Prof. Welcker's measurements.

The question discussed in this and in the preceding papers has been obscured by that unfortunate system of nomenclature and classification, not yet obsolete, according to which all skulls, not brachycephalous, are regarded as dolichocephalous. Objects which are not *short* are not therefore of necessity *long*; it being in the very nature of things that there should be intermediate forms, *neither long nor short*. We regard a skull as brachycephalic when it has a breadth-index of ·80 and upwards; but in practice, no one can distinguish by the eye a skull with a breadth-index of ·79, or even ·78, from one of ·80. The one is, by a slight fraction, only less brachycephalous than the other, though in some classifications the one would stand for a dolichocephalic, the other for a brachycephalic skull. It is scarcely possible to exclude from the mind the idea of *oval*, *mesaticephalic* or *orthocephalic* skull-forms, equally removed from the long and from the short. Nature presents to us all three, the one gliding into the other, though within defined limits, by scarcely perceptible gradations. The classification of races according to the form of the skull, has been laid open to just censure by the continued use, notwithstanding the objections of Welcker, Broca and myself, of the dichotomous system of Retzius. "The very terms," says an acute critic, "in which the cephalic index is described, proclaim it most arbitrary and conventional; since a mere ideal line separates the round from the long skulls." Crawfurd, *Trans. Ethnol. Soc.*, vol. vi, p. 129.

* *Archiv für Anthrop.*, 1866, i, pp. 135, 142, etc.

tricts, Dr. D. Wilson for the Lowlands of Scotland, Mr. J. R. Oliver for the Isle of Man,* and Dr. J. Barnard Davis for Britain in general, all in one form or other ascribe a brachycephalous skull type to the ancient Britons of the pre-Roman bronze period; and, consequently, to the people by whom the round barrows were erected.

LONG SKULLS FROM THE LONG BARROWS.

We may now turn to the primary and more important proposition, namely, the connection of long or dolichocephalic skulls with the large barrows of elongate form; or *Long barrows, long skulls.*

Twelve years ago, when I commenced my researches in the long barrows of Gloucester and Wilts, by reopening, in conjunction with Mr. E. A. Freeman, that at Uley, in the former county, the only authentic skulls from this description of tumulus in the south-west of England, were two in the Museum of Guy's Hospital, obtained thirty years previously at the first opening of this remarkable chambered barrow.† Since that time, I have lost no opportunity of suggesting and aiding in the exploration of this interesting class of tumuli; and skulls have successively been obtained, by myself or friends, from those of Littleton Drew, West Kennet, Rodmarton, Nympsfield, Charlton Abbots, and Oldbury, all of them situated either in North Wiltshire or in Gloucestershire.‡ The skulls from

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* Since this paper was read, I have been informed by Mr. J. R. Oliver, Hon. Sec. of the Manx Society, that he has opened thirteen tumuli of the round form, that the crania found in the central chambers were of the brachycephalic type; and that the skeletons measured 5 feet 10 inches to 6 feet, or even more. In the few long barrows he had opened, which contained skeletons, the crania were dolichocephalic.

† I have described both these skulls; of the one, of which there is a full-sized lithographic plate, in *Crania Britannica* (pl. 5, XXIV); the other, that of a girl of twelve or fourteen (rather than "nine or ten") in *Natural History Review*, April, 1865, v, 263 "On Synostosis of the Cranial Bones," etc., (separate copies, p. 24).

‡ These chambered tumuli and the skulls derived from them are described in *Crania Britannica*, pl. 24, XXV; pl. 50, XXVI; pl. 59, XXVII; and *Memoirs Anthrop. Soc.*, i, 131, 473, 474; where references to the more detailed archæological memoirs in regard to them will be found.

these megalithic long barrows are forty in number, twenty-seven being presumably those of men, and thirteen of women. The principal measurements of all are given in Table I, appended to this paper, from which it appears that not a single skull is brachycephalic, and that scarcely any deviate materially from the narrow elongate type. The breadth-index of the forty skulls ranges from ·67 to ·75 (in one instance only ·77); the average breadth-index is ·71⁵.

SKULLS FROM CHAMBERED LONG BARROWS IN GLOUCESTERSHIRE AND NORTH WILTS.—*BREADTH-INDEX.*

No. of Skulls.		Range.		Mean.
40.	...	·67 to ·77.	...	·71⁵.

In South Wilts, on Salisbury Plain, as on other parts of the chalk downs of the south of England, destitute of stone fit for the construction of chambers, long barrows are found similar in external form to the chambered ones of North Wilts and Gloucestershire. Some of these were explored early in this century by Sir R. C. Hoare and Mr. Cunnington, and were found to cover interments of entire skeletons under the broad and high, generally the east, end of the barrow; but in every instance without ornament, weapon, or other object of bronze or of any other metal. As, however, none of the skulls had been preserved, it was impossible to say what was their type; whether dolichocephalic, like those from the chambered long barrows of North Wilts and Gloucestershire; or brachycephalic, like those from the circular barrows so numerous on these downs and plains.

After many unsuccessful attempts at excavating a long barrow having the original interment intact, I succeeded, as narrated at length in my former paper, in meeting with one such at Winterbourne Stoke, and with another containing six skeletons in the same year, 1863, in the parish of Tilshead (East). In 1864, I re-opened the long barrow called Bowlsbury, and obtained from it four skulls and calvaria, left in it sixty years previously by Mr. Cunnington. In each instance the skulls from the primary interments were of the long narrow type, similar to those from the chambered barrows of North Wilts and Gloucester. None were brachycephalous. At the same

time, skulls obtained by other investigators from long barrows in Yorkshire, at Heslerton, Ebberston, and Dinnington, were also found to be remarkable for their dolichocephalic form.* The constantly recurring long type of skulls in barrows of this peculiar elongate type, appeared to me fully to justify the inference of my first paper of *long barrows, long skulls;* whilst the still more important conclusion was arrived at and established, that *the earliest inhabitants of Britain of whom the sepulchral monuments remain to us were markedly dolichocephalic.*

These views, however, have had to stand the test of criticism, and objections to them have been made in certain quarters. The inference, moreover, was one of so much curiosity and importance, as to lead me to seek further opportunities for its verification or otherwise; and since the publication of my former papers I have, with this object, during the years 1865, 1866, and 1867, opened as many as fifteen other of these large grave-mounds; and in seven of the number have been rewarded by finding the primary interments. These have yielded seventeen skulls capable of being measured, the number obtained from each productive barrow varying from one to nine. All, without exception, bear out the views previously adopted. I am the more desirous of placing this additional evidence on record, as the long barrows within my reach, accessible to excavation,

* I might also cite the experience of Mr. Bateman for so-called chambered barrows in Staffordshire and Derbyshire; but the more I consider his not very clear descriptions, the more doubt I feel as to their being strictly analogous forms of tumuli. They were, however, regarded by him as such; and I at least think it probable that several of them were really the tombs of the earlier dolichocephalic people of the stone age, the type of whose barrows is clearly not the same in all parts of the British Islands, and still less in France and the Channel Isles. In Ireland and in Caithness, the chambered barrows, probably nearly coeval with the long chambered barrows of Gloucestershire and Wilts, are, generally speaking, circular. It is still to be observed, notwithstanding that the Derbyshire chambered barrows were generally found to have been rifled, and the primary and secondary interments mixed by the riflers, that the mean breadth-index of eight skulls from them, measured by Dr. J. B. Davis, does not exceed ·72 (see *Cran. Brit.*, Table II, pp. 240, 245, and plate 33, xvi, p. 5). I exclude 141 c, with the extraordinary breadth-index of ·92, as being posthumously distorted.

have now nearly all been explored. Altogether, there are twenty-seven skulls and calvaria in my collection from the primary interments of the unchambered long barrows of South Wiltshire,* which are susceptible of measurement, twenty-one of which are probably those of men, and six those of women.

SKULLS FROM SIMPLE LONG BARROWS IN SOUTH WILTSHIRE.
BREADTH-INDEX.

No. of Skulls.		Range.		Mean.
27.	...	·63 to ·75.	...	·69.

These skulls are even more dolichocephalic than those from the more northern megalithic long barrows; the mean breadth-index of the one being ·69, and that of the other ·71. Geographically, the one class of barrows is separated from the other by the Vale of Pewsey and the Wansdyke; the boundaries, as may be presumed, between the two British tribes of Belgæ and Dobuni, the former immigrants, the latter, as is thought, primeval.

In general, there is a great conformity as to the breadth-index of the skulls from each barrow. Some are orthocephalous and others sub-dolichocephalous, but the range is of comparatively small extent, and the dolichocephaly of the skulls from each grave mound is marked and decisive. The following table shows this :—

CHAMBERED LONG BARROWS OF GLOUCESTER & NORTH WILTSHIRE.

	No. of Skulls.	Breadth-Index. Range.	Mean.
Uley, Gloucester.	2	·71-·74	·72⁵
Littleton-Drew, N. Wilts.	7	·68-·74	·71
West Kennet, „	4	·67-·73	·70
Nympsfield, Gloucestershire	2	·74-·75	·74
Rodmarton „	5	·71-·74	·73
Charlton Abbots „	17	·68-·77	·71
Oldbury, N. Wilts.	3	·68-·74	·71
	40	·67-·77	·71⁵

UNCHAMBERED LONG BARROWS OF SOUTH WILTSHIRE.

	No. of Skulls.	Breadth-Index. Range.	Mean.
Winterbourne Stoke	1	·75	·75
Tilshead (East) ...	5	·68-·74	·71⁵
Bowls Barrow ...	4	·65-·70	·67
Fyfield	1	·69	·69
Tilshead (Lodge) ...	2	·66-·68	·67
Figheldean ...	1	·67	·67
Tilshead (Old Ditch)	1	·68	·68
Netheravon ...	1	·69	·69
Stonehenge (165) ...	2	70⁵-·71	·71
Norton Bavant ...	9	·63-·73	·68⁵
	27	·63-·75	·69

* All these barrows are on Salisbury Plain, and from an area extending about twenty-five miles from east to west, and about fifteen miles from north to south. Several of the number are within sight of Stonehenge. In Table I,

If we combine the skulls from the two classes of long barrows into one series, we have altogether sixty-seven skulls, to compare with the seventy skulls from the round barrows; and the whole, when arranged according to the same principle as that adopted for that class of skulls (see p. 50), will stand as follows:—

Ancient British Long-Barrow Skulls.		Male. Nos.	Male. Proportions.	Female Nos.	Female Propor.	Both Sexes. Nos.	Both Sexes. Proportions.
I. Dolichocephali.	(·63–·70)	23	·49	9	·45	32	·48
Sub-dolichocephali.	(·71–·73)	18	·38	5	·25	23	·34
II. Orthocephali.	(·74–·76)	6	·13	5	·25	11	·165
Sub-brachycephali.	(·77–·79)	.	.	1	·05	1	·015
III. Brachycephali.	(·80–)	.	.	.	.	.	.
		47	1·00	20	1·00	67	1·00

A comparison of the two tables shows how greatly these long-barrow skulls differ from those from the round barrows. Among the latter is not a single dolichocephalous skull; among these not a single brachycephalous one. Upwards of four-fifths (82 per cent.) are, more or less, dolichocephalous (·67-·73); and nearly one-half (48 per cent.), typically, or absolutely so (·63-·70). A small proportion only (16·5 per cent.), are ovoid or orthocephalic; and only 1·5 per cent., represented by a single exceptional skull, is sub-brachycephalous, with a breadth-index of ·77.* The average breadth-index for the entire series is ·71.

SECONDARY INTERMENTS.

That the long barrows, yielding dolichocephalic skulls in their primary interments, are earlier in time than the round

the skulls from these unchambered mounds are distinguished from those from the chambered long barrows, by being marked as derived from *South* Wilts. There are some barrows of this class in North Wilts, but they are few in number, and have not afforded any crania.

* Professor Vogt, whilst appearing to accept the main conclusions of my former paper, observes, as to Table II, that "among the long-heads, Thurnam himself registers very decided short-heads as coming from long-barrows." (*Archiv für Anthropol.*, i, 38, *Anthrop. Rev.*, v, 347.) Vogt here overlooks my *note* at p. 475 (p. 65, separate copy), which shows that all the short-heads in this table are from secondary interments, that they are marked by letters and not figures, and are not included in the averages. I ought to have kept the secondary and primary skulls entirely apart, as in the present memoir.

barrows, yielding for the most part brachycephalic skulls, is, I think, proved by the observations made during the two past seasons on the *secondary interments* in the upper strata of several of them. In two or three instances, Mr. Cunnington and Sir R. C. Hoare met with skeletons within a foot or two of the summits of long barrows, which, from their extended position and the nature of the iron weapons found with them, were evidently Anglo-Saxon.* Some of the secondary interments are, however, clearly ancient British, of the bronze age; and in two instances at least, deposits of burnt bones, in one case enclosed in a British cinerary urn, were found by Mr. Cunnington and Sir R. C. Hoare near the tops of long barrows.† In no case whatever has *urn-burial* been met with at the base of a long barrow.‡ More important for our present purpose has been my discovery in five instances near the summits of long barrows of skeletons which were unmistakeably of the ancient British period. These skeletons were shown to be British, and not Anglo-Saxon, by their crouched or contracted posture, and in three instances by being associated with pottery of the character and period of which there can be no doubt. One case is that of a food-vase accompanying skeletons, the skulls from which have a breadth-index varying from ·81 to ·87.§ In two other instances, viz., in the

* *Ancient Wilts*, i, 100 (Sherrington, *Comp. Arch.*, xv, 344, pl. xviii, xix); i, 87 (Bowls Barrow); i, 72 (Boreham). In the long barrow at Tilshead Lodge, reopened by me, I found, within a foot of the summit, a skeleton stretched at length, with the iron umbo and other mountings of a shield, on the breast, and the remains of a small brass-bound bucket of wood at the head,—all objects clearly Anglo-Saxon. The breadth-index of the skull (No. 232) is ·76.

† *Ancient Wilts*, i, 90 (Tilshead, Old Ditch); i, 102 (Corton); comp. i, 66 (near Battlesbury).

‡ Imperfectly burnt bones have, in two or three instances, been found at the base of long barrows; though in one instance (Tilshead, Old Ditch, reopened by me), they accompanied, and did not merely replace, the interment of the entire skeleton. They were, perhaps, sacrificial, and the accompanying skeletons, in the other instance (Bratton Camp long barrow), may have been missed. See, also, Hoare, i, 83 (Knook).

§ See a woodcut of the vase, and lithographic plate of the very brachycephalic adult skull from the secondary interment in the long barrow of Winterbourne Stoke.—*Mem. Anthrop. Soc.*, i, 141, pl. ii.

Wilsford ("170") and Figheldean long barrows, the pottery consisted of beautiful "drinking cups" of the latest highly-decorated type, such as are found in the most modern circular tumuli. The skulls of the associated skeletons have a breadth-index of ·84 in the former, and ·78 in the latter instance. Altogether, there are in my collection eleven crania from the upper level of long barrows, which I attribute to the later British period, and which are certainly secondary. A majority of these, six of the whole number, differ wholly in their type from the skulls of the primary interments at the base of the long barrows, and are as brachycephalic as any of the skulls from the circular barrows (·80-·87): one is sub-brachycephalic (·78), two are orthocephalic (·75-·76), and two sub-dolichocephalic (·71-·73). Not one is truly dolichocephalic. One of these skulls (No. 257), that of a girl, from the Wilsford long barrow, having a breadth-index of ·71, belongs rather to the long, than to the round barrow type; but it is remarkable that no more of this elongate type were found among these secondary interments, if, as we may believe was the case, the long-headed people continued to survive among the round-heads.*

The evidence derived from these secondary interments appears to me very important, if not altogether conclusive; and I, therefore, arrange the skulls, according to their breadth-index, as follows:—

SKULLS FROM SECONDARY INTERMENTS IN THE SIMPLE LONG BARROWS OF SOUTH WILTS.

			Nos.	Proportions.
I.	Dolichocephali.	(—·70) ...	.	.
	Sub-dolichocephali.	(·71-·73) ...	1	·09
II.	Orthocephali.	(·74-·76) ...	2	·18
	Sub-brachycephali.	(·77-·79) ...	2	·18
III.	Brachycephali.	(·80-·87) ...	6	·55
			11	1·00

* Signor de Rossi has lately described an ancient tomb near Rome, in which were skeletons with skulls of the long type in the lower, and of the round type in the upper, stratum.—"Découvertes d'Antiquités Prehistoriques dans la Campagne Romaine." *Revue Archéologique, Juillet* 1867, p. 52.

COMPARISON OF ANCIENT BRITISH DOLICHOCEPHALOUS AND BRACHYCEPHALOUS SKULLS WITH THOSE OF OTHER PEOPLES.

To return from this digression, to the long-barrow skulls of the primary interments, the measurements of all of which are given, in the order of their breadth-index, in Table I.

The most important observation in regard to these skulls seems to be that, when compared with those of all peoples, they occupy a remarkable situation in respect of their low *breadth-index*. There is no people in Europe at the present day with skulls so dolichocephalous.* Their place is, indeed, almost at the top of the scale of dolichocephaly and brachycephaly, and alongside that of the skulls of Negroes, Hindoos, and New Caledonians.† Our 67 long barrow skulls have, indeed, about the same average breadth-index as is found in 66 African Negroes and 15 Australians, measured by Welcker; and, if arranged according to the German professor's method (Taf. II, fig. 6), the resulting figure would be almost identical with that shown by him for the Negroes. The 27 more elongate and narrower skulls from the simple long barrows of South Wilts, if separated from their congeners of the chambered long barrows, occupy even a higher place on the scale, near the Hottentots and Caroline islanders or "Olias." These crania of primeval Britons are, indeed, among the most dolichocephalous known. They are remarkable, not merely for length but for narrowness, and come strictly within the definition of *stenocephali*, to adopt the term introduced by Professor Lucae, and sanctioned by the use of Barnard Davis and Professor Welcker.‡

Dr. Davis has shown that the skulls of many Polynesians,

* Four of the more recently discovered long barrow skulls (Nos. 224, 233, 235, and 251) were exhibited at a meeting of the Anthropological Society of Paris, June 6, 1867. MM. Broca and Bertillon reported their measurements as yielding a mean breadth index of ·664, and observe, "Il résulte que l'indice céphalique de ces crânes indique un degré de dolichocéphalie extraordinaire qui ne se trouve jamais chez les Européens."—*Bull. de la Soc. d'Anthrop.*, s. s. t. ii, p. 357; comp. p. 676.—Through the kindness of the Committee of the Paris Society, we are enabled to reproduce, from the *Bulletins*, woodcuts of three of these skulls.

† See Professor Welcker's very valuable tables, *Archiv für Anthrop.*, i, 135, 138, 154, 157, Tab. I, II, VI, VII.

‡ *Anthrop. Review*, 1866, iv, 54; *Archiv für Anthrop.*, 1866, i, 152.

viz., the Melanesians of New Caledonia and of the New Hebrides, and also Caroline Islanders, are distinguished not only by great length and narrowness, but also by great proportionate height and by a ridge-like elevation of the vertex, in the line of the great longitudinal sutures. These characters, as Dr. Davis points out, are so marked as to justify our regarding these peoples as approximating in their skull-form to that of the synostotic scaphocephali; and, as he says, "they may with propriety be designated 'natural scaphocephali.'"* This term, *natural scaphocephali*, appears to me to be almost equally applicable to a large proportion of our long-barrow skulls,† in which these characters, of length, narrowness and carinated vertex, are present in a remarkable degree. As regards elevation, though a great majority of the skulls of men are high skulls, they are not, as a rule, by any means so high as the Polynesian skulls here referred to. As Table I shows, their *height-index* exceeds their breadth-index by the figure 2 (A ·70 to B ·72);‡ whereas in the 7 Caroline Islander skulls, measured by Professor Welcker, the excess is represented by the figure 6 (A ·68 to B ·74).§ On the other hand, we learn from Professor Van der Hoeven, that one of these Caroline Islanders' crania (No.

* Barnard Davis, M.D., *On Synostotic Crania among Aboriginal Races*, 1865, p. 31; *Deformations of the Skull; Proceedings of Scandinavian Naturalists*, 1865, p. 5; *Anthrop. Review*, 1866, iv, 54; *Thesaurus Craniorum*, No. 817, p. 311.

† Already designated *Kumbecephali* by Prof. Dr. D. Wilson. *Prehistoric Annals of Scotland*, p. 166, 169, 180. Blumenbach had long ago written of "the narrow, and as it were, *keeled* head of the Ethiopian."

‡ In my former tables, I and II (*Mem. Anthrop. Soc.*, i), the height-index of the long-barrow skulls was shown to exceed this breadth-index by the figure 3 (A ·70 and ·71 to B ·73 and ·74). This is caused by the Yorkshire long-barrow skulls from Dinnington being included in those tables. The difference, on the large scale, is possibly more truly represented by 3, than by 2.

§ The six Isle of Pines (New Caledonian) skulls in the Museum of the College of Surgeons (5402 A.-F.), presented by Capt. Sir Everard Home, attracted my attention, several years since, by their long and narrow form; and I measured and took notes of them, at that time, for comparison with those from the long barrows. They have a mean breadth-index of ·70⁶, and a height-index of ·78. They are consequently much higher than our British *hypsistenocephali*, which, as a rule, are not typically such.

VII), has a height-index which only exceeds the breadth-index by 2 (A ·72 to B ·74). Again, in a few instances, the long barrow British skulls have a preponderance of the height-index which more than exceeds the average of the difference in the Caroline Islanders, and is represented by figures as high as 6, 7, 8, and 10. Altogether, notwithstanding the varieties in the relations of the two indices revealed by Table I, many of them seem to fall into the class of *hypsi-stenocephali*, the designation introduced by Dr. Barnard Davis for high narrow skulls, and which has received the sanction of Professor Welcker.*

Professor Welcker, from an immense number of measurements, has ascertained that the average height-index of dolichocephalous skulls of all peoples is ·74, and that of brachycephalous skulls ·76.† It is interesting to observe that these figures nearly correspond with those which I obtain for our ancient British dolichocephali and brachycephali, and which are ·73 and ·77 respectively. But it does not hence follow that though the dolichocephali are absolutely lower, they are therefore truly low, and the brachycephali truly high skulls. On the contrary, Welcker shows very clearly that a skull is to be regarded as "*high* when the height-diameter, *flat* when the breadth-diameter, is next to the longitudinal diameter, the chief measure of the skull." According to this view, it is height in its relation to the breadth, not absolute height, which determines the claim of any series of skulls to be regarded as high or as flat.‡

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* See "Skull-heights in their relation to the breadth of skulls", being section vi of Professor Welcker's recent memoir, "Kraniologische Mittheilungen," in the *Archiv für Anthropol.*, i, 152. Welcker considers that all skulls may be classed according to a quinary system, either as—1. high and narrow, *Hypsistenocephali*; 2. high and broad, *Hypsibrachycephali*; 3. middle high and middle broad, *Orthocephali*; 4. flat and narrow, *Platystenocephali*; and 5. flat and broad, *Platybrachycephali*: of these, he regards the first, middle, and last as typical; the two others as exceptional forms.

† Welcker, *loc. cit.*, p. 153.

‡ Hitherto, with Retzius, it has been customary to judge of the height of skulls according to the length-height index, and not according to the breadth-height index, as Welcker now suggests: "Chez les dolichocéphales la hauteur du crâne ordinairement base; . . . chez les brachycéphales la hauteur du crâne, comparée avec la longeur, considérable" (*Schriften*, 118, 121). I was myself in the habit of regarding platycephaly as complementary

of our long-barrow folk far away in Africa, India, Australia, the Melanesian Islands, and among the Esquimaux. In the following comparison, most of the measurements are taken from the tables in Professor Welcker's late memoir; they are all in millimetres:—

	No. of Skulls.	Measurements.			Index.	
		L.	B.	H.	B.	H.
Ancient British Long Barrow Skulls of Males	48	195 ...	139 ...	143	·71 ...	·73
Caroline Islanders (Olias)	7	187 ...	128 ...	139	·68 ...	·74
New Caledonians -	2	— ...	— ...	—	·69 ...	·76
„ (Isle of Pines*)	6	182 ...	128 ...	142	·70 ...	·78
Australians - - -	15	180 ...	126 ...	135	·70 ...	·75
Kaffirs - - - -	20	— ...	— ...	—	·69 ...	·74
Negroes - - - -	66	181 ...	126 ...	132	·70 ...	·73
Hindoos - - - -	18	— ...	— ...	—	·70 ...	·75
Esquimaux - - -	18	186 ...	131 ...	138	·70 ...	·74

The following is a similar comparison for the round-barrow skulls:—

	No. of Skulls.	Measurements.			Index.	
		L.	B.	H.	B.	H.
Ancient British Round Barrow Skulls of Males	56	185 ...	149 ...	142	·81 ...	·77
Czechs - - - -	27	177 ...	145 ...	134	·82 ...	·76
Slovaks - - - -	6	176 ...	143 ...	134	·81 ...	·76
South Germans - -	80	182 ...	146 ...	134	·80 ...	·74
Finns - - - -	11	179 ...	141 ...	134	·79 ...	·75

It is remarkable, as regards these ancient British skulls, both dolichocephali and brachycephali, that though the relation of the breadth-index and the height-index corresponds very much with that in certain modern peoples (the former with uncivilised and the latter with civilised), yet the actual measurements are so much in favour of these early inhabitants of Britain. The cranial capacity, and consequently the brain-weight, of both peoples has been very decidedly high.

Although the long barrow skulls are for the most part high (hypsicephalous), yet in a certain proportion, or one-sixth of

* The six New Caledonian skulls from the Isle of Pines, are those in the College of Surgeons' Museum, referred to in a former note; the measurements of which are my own.

those of men (8 out of 48), the height-index falls short of the breadth-index. The tendency to platycephaly is both much more frequent and much more marked in the skulls regarded as female; and in more than one-third (7 out of the 19), this relation is observed. Indeed, the average breadth-index and height-index is represented by the same figure, ·71; so that the female skulls cannot be called hypsicephalic at all, but are orthocephalic. Such exceptions to general rules, as regards the relative proportions of breadth and height-index, probably occur among the skulls of all peoples. If we may trust the late Professor Vrolik's measurements, opposed as they are in this instance to those of Professor V. der Hoeven, one of the female Olia or Caroline Islander skulls (that of *Natioli*) differs from all the rest in being platycephalic, and has a height-index of only ·72, as opposed to a breadth-index of ·73. One skull (No. 15♀, Table I) from Tilshead East, engraved and fully described in my former paper,* has the height-index as low as ·65; and has been adduced by Professor Ecker as particularly illustrative of the flattening of the vertex shown by him to be characteristic of many female skulls.† Another female skull, also very remarkable for its flat vertex (H-I. ·68, No. 3♀, Table I.), from Tilshead, Old Ditch, has since been added to the series in my collection. It is represented in Fig. I. of the woodcuts. Such skulls range themselves as to their form, with those of Hottentots and Bosjesmen,‡ and are *Platystenocephali*.

Among the brachycephalous skulls from the round barrows, the general rule of the height-index being represented by a minus figure as compared with the breadth-index, meets with very few exceptions. No more than 7 of the 56 male skulls, and not one of the 14 female skulls deviate from this rule; though the two most dolichocephalous of the male series have the height-index so high (B-I. ·74, H-I. ·80), as to be hypsicephalic. The observation as to the exceptional forms of individual examples in these two classes of ancient British skulls, is seen to

* *Mem. Anthrop. Soc.*, i, 148, Pl. III.

† *Archiv für Anthrop.*, i, 86.

‡ The Bosjesman skull, No 5357, ♀, in the Royal College of Surgeons' Museum, has, I find, a breadth-index of ·76, and a height-index of ·72.

accord with Welcker's remark on the skull-forms of different peoples, that "there are, although isolated, even flat dolichocephali and high brachycephali;" and likewise that "the greatest deviations of the height-index are found in the middle of the scale, in the orthocephali" (B ·73-·77).*

COMPARISON OF ANCIENT BRITISH DOLICHOCEPHALOUS SKULLS WITH THOSE OF MODERN BASQUES.

The sixty Spanish Basque skulls, from the province of Guipuscoa, in the Collection of the Anthropological Society of Paris, were, in my former paper, compared with the long-barrow skulls.† After that memoir was written, viz. in the summer of 1864, I had the opportunity of again examining them, and on that occasion took the principal measurements of all of them. As M. Broca has only given us a summary, though a most valuable one, of the results obtained by him, it appears desirable to print my detailed measurements of these Basque skulls, which I have therefore arranged, according to their probable sex, and in the ascending order of their breadth-index, in Table III. I have not excluded the three skulls of children, that not having been done by M. Broca, and as it is obvious that their retention will not appreciably affect the averages. The internal capacity given for each skull, is that obtained by M. Broca, and inscribed by him in cubic centimetres, on each cranium. M. Broca gives ·77⁵ as the average breadth-index of the entire series, whilst I make it no more than ·76. I was informed, when in Paris, that these skulls when exhumed, were for security deposited, for several hours, in a tank of water. It is hence probable that they were still somewhat damp, when measured by M. Broca, shortly after their arrival in Paris; and that they were thoroughly dry when submitted to my callipers, nearly two years later. When skulls

* *Archiv für Anthrop.*, i, 155. Prof. Welcker shows the reason of this apparent irregularity, when he observes that it is "in this region the two opposite forms, typical dolichocephali, with their broader extreme instances, consequently hypsicephali (in our Table I), and typical brachycephali, with their narrower offshoots, thus platycephali (in our Table II), radiate and mix with each other" (as to form).

† *Mem. Anthrop. Soc.*, vol. i, p. 130, 160; separate copies, p. 11, 41.

are wet, they have a greater breadth-index than when dry; for, as Professor Welcker has shown, "The recent skull in drying, changes its form a little in a dolichocephalic direction."*

In the year 1866, a second series of Spanish Basque skulls, nineteen in number, from the same Guipuscoan cemetery, was added to the collection in Paris; of which skulls, through the kindness of M. Broca, I was likewise enabled, in the summer of 1867, to take the chief measurements. I have added these measurements to the Table; but, as two skulls only (Nos. 1 and 7), seem to be those of women, I have not separated them according to the sexes. My measurements agree as closely with the average results of M. Broca, as those by two manipulators can be expected to do. The breadth-index for this series, according to both, is ·76. This conformity gives me confidence, as regards the other series of sixty skulls, that my measurements are likewise correct, and that the discrepancy which has been pointed out is to be attributed to the different hygrometric condition of the crania at the time of the two sets of measurements being taken.

Taking the whole of these Basque crania, their mean breadth-index of ·76 is one equally removed from that of typical dolichocephalic and brachycephalic skull-forms; of the former of which our long barrow skulls are an excellent instance, as the round barrow skulls are of the latter. For the former, as we have seen, the mean breadth-index is ·71; for the latter, ·81. The preponderating ovoid or orthocephalic type of the Basque skulls is perhaps still better brought out, on distributing them, according to the convenient quinary classification previously adopted, as follows:—

Spanish Basque Skulls.		Male.		Female.		Both Sexes.	
		Nos.	Proportions.	Nos.	Proportions.	Nos.	Proportions.
I. Dolichocephali.	(—·70)	.	.	.	.	.	.
Subdolichocephali.	(·71—·73)	6	10·5	5	22·8	11	13·8
II. Orthocephali.	(·74—·76)	24	42·1	9	40·9	33	41·8
Subbrachycephali.	(·77—·79)	23	40·4	7	31·8	30	38·
III. Brachycephali.	(·80—·83)	4	7·	1	4·5	5	6·4
		57	100·	22	100·	79	100·

* *Wachsthum und Bau*, p, 139.

† *Bull. de la Soc. d'Anthrop.*, second series, t. i, p. 470; t. ii, p. 10-30.

This table should be compared with that at page 50, for the round-barrow skulls, and that at page 56, for the long-barrow ones. An examination of the three shows how remarkably they differ; the long and round-barrow skulls crowding around the high and the low figures respectively, while the Basques gravitate almost entirely to the intermediate and central figures. But, though not typically dolichocephalic, the Basque crania, as compared with those of Europe generally, and especially with those of France, are relatively dolichocephalic; and nothing is more striking than the very small proportion of brachycephalous skulls which are found in the series. According to the high authority of Professor Virchow, two at least of the brachycephalous skulls of the series owe their brachycephaly to synostosis of the transverse sutures.* They are probably the skulls of a decidedly mixed, though originally dolichocephalic, people; the original type having been modified by a moderate brachycephalous infusion, continued through many generations.

It has already been shown from my measurements, (*ante* p. 63), that, as in other modern Europeans, the mean vertical diameter of these Basque skulls falls decidedly below the transverse. The reverse, as I have shown, is the case in the long-barrow dolichocephali.*

I still adhere to the opinion that the tendency to a dolicephalous type in the Basques is derived from the ancient Iberians; and that the brachycephalous admixture is Gaulish. More evidence as to this, it is to be hoped, may be derived from

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* "Two of the Basque skulls belonging to the Anthropological Society of Paris, have been described as unusually brachycephalic; but it will be found that they both exhibit a premature ossification of the transverse sutures. The Basque skull is eminently dolichocephalic, and in this respect it resembles the ancient crania which are found in the oldest tumuli of North-eastern Germany."—Prof. Virchow, at "The Anthropological Congress of Paris of 1867," *Med. Times and Gazette*, 7th March, 1868.

† M. Broca's vertical diameter is a *basilo-bregmatic* one, and differs entirely from that generally employed by cranioscopists. My "greatest-height" is taken, as usual, between the plain of the *foramen magnum* and the bregma, or vertex, of the skull, a little behind the point of junction between the sagittal and coronal sutures.

researches conducted by the members of the Anthropological Society of Madrid; from whom no contributions would be more acceptable than such as might clearly reveal to us the ancient and modern cranial types, for different parts of the Iberian Peninsula.

Our views as to the Spanish Basque skulls, derive much support from all I have yet been able to learn, respecting the series of 57 French Basque skulls, from St. Jean-de Luz, added during the past autumn, 1867, to the collection of the Anthropological Society of Paris, through the enterprise of M. Broca. These crania, it is stated, show a very much greater tendency to the brachycephalous type, than do those of the Spanish Basques. This, if the views here advocated be correct, was to have been expected in the descendants of an Iberian people, settled in a Transpyrennean country, in the midst of, and surrounded by, Gaulish tribes.†

Different Characters of the Face in the Ancient British Dolichocephali and Brachycephali.

It is unnecessary to repeat here, what I have before said as to the contrasted characters of the face, in the two classes of ancient British skulls.* I must, however, point out, that though in our dolichocephali of the long barrows the cranium proper corresponds so much in form with that of the Negroes, and Melanesian Islanders, the face-cranium is remarkably and altogether different, and so proves the absence of any genetic relationship. There is in particular none of the prognathism, exaggerated malar breadth, or great width of the nasal openings, which give an air of savageness and ferocity to the skulls of the New Caledonians and Caroline Islanders; but the very reverse of all these. They are, indeed, more orthognathic even than many modern Europeans, and the facial characters generally are mild, and without exaggerated development in any one direction. The contrary is the case in the brachycephalous skulls from the round barrows, to which the very large and prominent facial bones give a claim to be regarded

* *Mem. Anthrop. Soc.*, i, 150-154.

† Since the above was written, an elaborate description of these French Basque skulls has been given by M. Broca.—*Bull. de la Soc. d'Anthrop.*, s. s. t. iii, p. 43-101.

as more or less prognathic, and preeminently macrognathic. The face in the dolichocephalic races of Europe is defined, by M. Pruner Bey, as *oval*, and in the brachycephalic, as *angular* or *lozenge-shaped*. These definitions may be accepted as also applicable to our ancient British long-heads and round-heads; though they scarcely succeed in expressing the more striking facial characteristics of these crania.

Premature Obliteration of the Sutures in the Ancient British Dolichocephalic Skulls.

The great tendency to obliteration of the sutures, before observed in the long barrow skulls,† is fully confirmed by observation on the additional examples obtained in the excavations of the two past years. The sutures are seen to be obliterated disproportionately to the apparent age, as judged of by the degree of dental attrition and other circumstances. The sagittal suture especially is often effaced, sometimes, as would appear, by *infantile*, at others by *premature senile*, obliteration. At times, the sagittal suture is almost entirely obliterated, whilst the coronal and lambdoid are open; but, in an equal number of instances, the sagittal, coronal, and lambdoid are all equally effaced. The dolichocephaly, therefore, of these skulls cannot be regarded as the effect of synostosis; but, on the contrary, the dolichocephaly and tendency to synostosis of the parietals are both race-characters; and the latter is more probably an effect of dolichocephaly than its cause. As I have previously shown, "it is not improbable that in dolichocephalous peoples the great longitudinal sagittal suture (in the same way, though in a much less degree than the frontal), may be more prone to obliteration than the transverse sutures, in consequence of the suture margins being more early brought into apposition, from the growth of the brain being more active in the longitudinal direction than in the transverse."*

Not only have no facts adverse to this view been brought to

* *Mem. Anthrop. Soc*, i, 154-155. "On Synostosis of the Cranial Bones, especially the Parietals, in one class of Ancient British and African Skulls." —*Natural History Review*, No. 18, 1865, p. 242.

† *Nat. Hist. Rev., l. c.*, p. 246 (separate copies, p. 5).

light, but one recently acquired skull is particularly valuable, as affording strong additional proof of its accuracy. It is that of a young woman, of perhaps eighteen years of age, and was obtained from the long barrow of Norton Bavant. The spheno-basilar symphysis is still open. The skull (No. 251 of my Collection), is of markedly sub-scaphocephalic form, and presents likewise a slight grade of *klinocephaly*. The breadth-index is not more than ·64, and it is, with one exception, the narrowest or most dolichocephalic skull I have yet obtained from the long barrows. It is not possible, in this instance, for any one to attribute the dolichocephaly to synostosis. *Every suture, longitudinal as well as tranverse, is seen to be open, both on the inner and outer surface of the skull.* In regard to the question before us, this cranium constitutes a crucial instance, entirely opposed to the view of the dolichocephaly of these skulls being caused by synostosis. Had the individual lived to the period of middle age, it is very possible, nay probable, that premature senile obliteration of the sutures might have taken place; but if so, it is clear that this would have been an effect of dolichocephaly, and in no degree whatever its cause. It is just such immature skulls as that before us, and as that previously referred to from the chambered long barrow at Uley,* which are so extremely valuable, as enabling us to form a just estimate of the probable influence of synostosis in modifying the form of the skull.

Difference of Stature in the Ancient British Dolichocephali and Brachycephali.

In the former paper,† I deduced the stature of the two peoples whose cranial remains have now been compared, from ten femora of men from long barrows, and from ten others from round barrows; and I there showed that the probable mean

* *Ibid.*, p. 263 (p. 24). The skull, No. 251, described in the text, and a woodcut of which is also given (see fig. 3), though much more dolichocephalic, is very similar, in form and proportions, to the remarkable cranium, perhaps of a New Caledonian, described and figured by Professor Huxley, and in which, with a breadth-index of ·73 ("·729"), the sagittal and other sutures are distinctly open. See *Journal of Physiology*, vol. i, p. 60, Nov. 1866.

† *Mem. Anthrop. Soc.*, i, 159.

height, as calculated from the length of the thigh bones, was 5 feet 5 inches for the dolichocephalous Britons of the stone age; and 5 feet 9 inches for the brachycephalous Britons of the bronze age; being a difference of no less than 4 inches, or 10·16 centimetres. Since that time, I have collected many additional observations of the length of the thigh bones from primary interments in long barrows. I have now altogether twenty-five measurements, all taken by myself, representing an equal number of separate male skeletons, fourteen being from the chambered, and eleven from the simple or unchambered, barrows.* In Tables I and II of *Crania Britannica*,† there are twenty-seven measurements of thigh bones from the round barrows, twelve being of skeletons, the skulls of which are engraved and described in that work. Of these twelve, five were measured by myself, and seven by Dr. J. Barnard Davis. The other fifteen measurements are of femora, from the round barrows of Derbyshire and Staffordshire, still preserved in the Bateman Collection, and were taken either by Mr. Bateman or by Dr. Davis. On calculating the mean length of the twenty-five femora from the long barrows, I find this to be exactly 18 inches, or 45·7 centimetres,† and that of the twenty-seven femora from the round barrows to be 18·8 inches, or 47·75 centimetres.‡

If, with these data, we accept Professor Humphry's probable estimate, that the average length of the thigh bone is as 27·5 to the stature represented by 100, we shall find that the mean stature of the dolichocephalic men of the long barrows was

* The fourteen femora, from the chambered long barrows of Gloucestershire and North Wilts, average 17·9, the eleven from the simple long barrows of South Wilts, 18·2 inches; the difference being no more than 0·3 inch, or 7·4 millimetres. Nothing can be inferred from so slight a discrepancy.

† *Crania Britannica*, p. 240-245.

‡ The twelve femora, from the round barrows of England, measurements of which are given, *Cran. Brit.*, Table I, have an average length of 19·13 in.; and the fifteen, from the round barrows of Derbyshire and Staffordshire, in *Cran. Brit.*, Table II, an average of 18·56 inches. or more than half an inch (·57 in.) less. The first series may be regarded as consisting of picked instances, and may have included the remains of a greater number of chieftains remarkable for their stature.

5 feet 5·4 inches, or 1.661 metre, and that of the brachycephalous men of the round barrows 5 feet 8·4 inches, or 1·737 metre. The excess of stature, in favour of the brachycephalous Britons, is thus found to amount to 3 inches, or 7·6 centimetres. The difference is not quite so great as that formerly deduced from more limited data, but is amply sufficient to support the inference of a difference of race being implied by so considerable a difference in stature.

Anchylosis of Cervical and Dorsal Vertebræ in Ancient British Dolichocephali.

A peculiarity, which I have frequently noticed in the human remains from the long barrows, may be briefly referred to. This consists in an anchylosed condition of two or more of the cervical, or upper dorsal, vertebræ. "Two dorsal vertebræ, feebly united by anchylosis," were obtained from the chambered long barrow at Uley, and are preserved in the Museum at Guy's Hospital;* and when this tumulus was re-opened in 1854, I found, in searching among the debris of human remains, in the chambers, two other upper dorsal vertebræ united in the same way. The same condition was observed in the remains sent to me from the neighbouring chambered tumulus at Nympsfield; and in those likewise from Charlton Abbots; in the last of which, two of the lower cervical vertebræ were found anchylosed. Again, when the Rodmarton chambered barrow was opened, three, if not four, cervical vertebræ, firmly soldered together into one piece, were picked out of the remains. I have found the same thing in the unchambered long barrows of South Wilts; and have one remarkable specimen from that at Fyfield, in which the *vertebra dentata* and the third vertebra of the neck are fused together into a single bone.†

I would not assert that this morbid condition is confined to remains from the long barrows. It is, however, certainly not of rare occurrence; whilst it is very uncommon and almost unknown, so far as my experience extends, in the round barrows. It hence seems to be indicative of some peculiarity in

* Catalogue, No. 3202.

† *Cran. Brit.*, Pl. 5, xxiv, p. 3. Pl. 59, xxvii, p. 3. *Mem. Anthrop. Soc.*, i, 476.

the mode of life of the people in whose remains it is observed. That many of the peoples of Northern Europe were at one time partially *troglodytic*, and occupied subterranean cave-dwellings, at least during the winter, we have abundant testimony. Diodorus tells us that the Britons had subterranean repositories for their corn.* Tacitus says the same of the ancient Germans; and adds that they took up their abode in them during the cold of winter:† the same may have been true of the Britons. It is certain that if the entrances to these dwellings of the living were as narrow and contracted as in those which remain to us of the dead, they could only have been entered on all-fours, and that not without risk of injury. Of the subterranean dwellings and granaries of some of the British tribes, we have the probable remains in the *weems* and *Picts-houses* of Scotland, and in more or less analogous structures found both in Cornwall and Ireland. The entrances to the Scotch weems and earth houses is generally by a long passage, which is often less than two feet wide and three feet high.‡ It is clear that in the entrance to, and exit from, dwellings thus constructed, the head and neck would be very much exposed to violent concussions against the sides and roofs of these narrow passages and doorways; and it is not, perhaps, improbable that anchylosis of the vertebræ may have resulted from such violence. It would be desirable to ascertain whether our mining population, whose labours are carried on in low, narrow, and dark galleries and chambers, are not liable to injuries of the neck, resulting in vertebral anchylosis such as that of these ancient Britons.

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* Diod. Sic., v, 21.

† Tacitus, *Germania*, 16, "Subterranei specus, suffugium hiemi." See, also, what Virgil says of other northern nations, *Georgic.* iii, 376. The historical notices of subterranean dwellings in Britain and in the rest of Europe, of necessity refer to the *bronze*, if not even to the *iron*, period. The discoveries, however, in the cave-dwellings of central France, and the comparison of the probable habits of the people by whom they were inhabited, with those of the Esquimaux, show that such dwellings and such a mode of life were, in all likelihood, much more common in the *stone* period than in the succeeding ones.

‡ *Archæologia*, xxxiv, 127.

Summary of Inferences.

It will be convenient to conclude this paper with a summary, in which may be arranged the principal inferences and conclusions to be deduced from it, and from my preceding memoir, under fourteen different heads.

I. The skulls from the primary interments in the *long barrows* of Wiltshire and Gloucestershire, and, it is believed, of South Britain in general, are of a strongly-marked dolichocephalic type, having a mean breadth-index of ·71; which is much lower than that of any modern European people. No brachycephalic skull, with a breadth-index of ·80, or upwards, has been obtained from the primary interments in these barrows. No objects of metal or of decorated pottery are known to have been found with these interments, but only those of stone, bone, or horn. We refer, therefore, these long barrows to the *stone period.*

II. The skulls from the primary interments in the *round barrows* of the same districts, and, it is believed, of South Britain in general, are of more or less brachycephalous proportions, having a mean breadth-index of ·81; much higher than that now found in the population of any part of England and Wales.* Objects of bronze, and, very rarely of iron, and richly-decorated pottery are found in them, with or without objects of stone. These round barrows, therefore, we refer to the *bronze period,* and to that of *bronze and iron transition.*

III. The skulls from secondary interments in the upper strata of the long barrows are, in most cases, of similar brachycephalous proportions with those from the primary interments in the round barrows. They have, in a few instances, been found in connection with decorated British pottery, altogether identical with that of the round barrows. They are doubtless the remains of the same people as that by whom the circular barrows were erected; and for all intents and purposes they may be regarded as round-barrow skulls.

IV. It has never been pretended that there is any necessary

* See table by Dr. Beddoe, *Mem. Anthrop. Soc.*, ii, 350.

connection between long skulls and long barrows, or round skulls and round barrows; and the dolichocephalic people, who, in this part of England, buried in long barrows, may elsewhere have erected circular tumuli over their dead. The important question does not regard the form of their tombs, so much as the sequence of the two peoples in the order of time and civilization. As to this, it is contended that the long-heads were the true primeval race; and that they were succeeded by a taller, more powerful, and more civilised people, who gradually extended themselves and became dominant, through a great part, perhaps nearly the whole, of the island.

V. These British dolichocephali, or long-heads, are the earliest people whose sepulchral monuments can be shown to remain to us. The exploration of their tombs—the long barrows—shows that they buried their dead entire, and almost always without cremation; that they possessed herds of small, short-horned oxen, the *Bos longifrons* or *Bos brachyceros*, and that they subsisted largely on the chase of the red deer, and wild boar; that some of their customs were barbarous in the extreme; and in particular that, if not addicted to anthropophagism, they, at least, sacrificed many human victims, whose cleft skulls and half-charred bones are found in their tombs.

VI. The brachycephalous people, or round-heads, who buried in the round barrows, were more civilized than the dolichocephali, and may be inferred to have brought with them the more common use, if not the first knowledge, of bronze. The exploration of their tombs shows that burning the dead was with them the prevailing and fashionable, though not exclusive, mode of burial; and the appearances are consistent with what we are told of the funerals of the Gauls (their supposed congeners) by Cæsar and Pomponius Mela. From the same source, or the appearances in their tombs, we should infer that they had advanced from the nomadic, pastoral, and hunting condition, to a more settled agricultural stage of culture; and that, if they had not altogether abandoned the more barbarous customs of their ancestors, and in particular that of human sacrifice (which all history tells us was, at one time, everywhere prevalent), they had, at least, restricted them within narrow limits.

VII. There is no proof, nor is it in the least probable, that the brachycephalic extirpated the earlier dolichocephalic people. It is far more likely that they reduced them to slavery, or drove them, in part, into the interior and western parts of the island. When once subdued to obedience, they may have lived with them on friendly terms, and even mingled with them in domestic relations. In some districts, the brachycephali would probably entirely replace the earlier race; whilst in others, the dolichocephali would live on under the supremacy of their more powerful neighbours. A mingling of the remains of the two peoples in their later tombs must almost certainly have ensued.

VIII. The two races, the existence of which is made known to us by researches in the tumuli, are most naturally identified with the two peoples, strongly contrasted in their manners, whom Cæsar describes in well known passages of the 12th and 14th chapters of the 5th book of his Commentaries.* According to this, the short or round-heads of the bronze period are the same as the agricultural people of the maritime districts, who are said by Cæsar to have migrated from Belgic Gaul; and the long-headed people of the stone period are the pastoral and less-civilized people of the interior, reputed aboriginal, and who, prior to the coming of the others—as to which event there is no certain note of time—must have occupied, and been dominant in, the maritime parts, as well as in the interior of the island.

IX. The origin and ethnic affinities of these two peoples can only be discussed conjecturally and tentatively in the present state of science. An often-quoted passage in the *Agricola* of Tacitus, seems, however, to indicate part of the probable solution.† The great Roman historian points out, first, the dark complexion and curly hair of the western tribe of the Silures; and secondly, the similarity of the appearance of the

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* Quoted *antea*, p. 43, *note*.

† Tacitus, *Agric.*, xi. "Silurum colorati vultus, torti plerumque crines [Jornandes adds 'et nigri'], et posita contra Hispania. Iberos veteres trajecisse easque sedes occupasse, fidem faciunt. Proximi Gallis et similes sunt * * * * In universum tamen æstimanti Gallos vicinum solum occupasse credibile est."

Southern Britons to their neighbours in Gaul. And he adduces the very obvious argument from these differences of physiognomy and appearance, that the Silures were descended from the Iberians of Spain, whilst the Southern and South-eastern Britons were derived from the people of the opposite coast of Gaul. As evidence of this last position, Tacitus refers to the similarity of the religion, language, and moral and mental temperament of the Britons and Gauls. It is not improbable that in this passage the Silures are named *κατ' ἐξοχῆν*, as a principal tribe, and as representative of others not, like themselves, confined to the extreme west of the island. By Cæsar, however, who knew nothing of the west of Britain, the Silures would be regarded as *interiores*, just as the regions producing tin were, and termed by him *mediterranei*. The *proximi Gallis* of Tacitus are clearly the same people as those of the *maritima pars* of Cæsar.

X. The geographer, Strabo, is another important witness for a great difference in the features and personal characteristics of the Iberians and Gauls. In the course of his fourth book, he twice tells us that the Iberians differed entirely in their bodily conformation from the Gauls, of both "Celtica" and "Belgica," who, he expressly says, participated in the common Gaulish physiognomy.* It is evident that, if we interpret this observation of Strabo's by the light of that just quoted from Tacitus, we must picture the Iberians as a swarthy or *melanous* people, with dark complexion and curly dark hair. They would thus be strongly contrasted with the Gauls, who, by the classical writers, are uniformly represented as fair, or *xanthous*, and, moreover, as of tall stature. Compared with the Gauls, the Iberians, like other southern Europeans, were probably a people of short stature. We derive no light from the remains in the barrows as to the colour of the hair and the complexion of those buried in them; but they do enable us to ascertain a difference of height. The measurement of the skeletons, and especially of the thigh-bones, from the long barrows and the round barrows respectively, clearly demonstrate

* Strabo, iv, 1, § i; iv, 2, § i.

that the dolichocephali of the former, as compared with the brachycephali of the latter, were a people of short stature. The mean height, as calculated from the measurement of 52 male skeletons or femora, was about five feet six inches in the one, and five feet nine inches in the other; the average difference being no less than three inches.

XI. The cranial type of the ancient Iberians has not yet been so conclusively ascertained as is to be desired. But the examination of the large series of skulls of modern Spanish Basques at Paris, as well as of such Spanish and Portuguese skulls as exist in English and Dutch collections, altogether justifies the presumption that the Iberians of antiquity were a decidedly dolichocephalous people.

XII. The British brachycephali of the bronze period are to be regarded as an offshoot, through the Belgic Gauls, from the great brachycephalous stock of Central and North-eastern Europe and Asia; in all the countries of which—France, Switzerland, South Germany, Bohemia, Poland, Russia, and Finland—the broad and short cranial type is still the prevailing one.

The earlier British dolichocephali of the stone period were, we think, either derived from the ancient Iberians, or from a common source with that people. Not only was Spain peopled by the Iberian race, but even, in historical times, a considerable part of Gaul; and there is no improbability in the conclusion of its having occupied the British Islands likewise.

XIII. As to the origin of the Iberians themselves, it is better to confess our ignorance than to indulge in premature speculations. Some, as Professor Vogt, would bring them from America by way of a lost Atlantis, or "connecting land between Florida and our own continent, which, in the middle tertiary (miocene) period, was still above the water." Others, as M. Broca, search for them in Northern Africa; others, in the more or less far East; whilst Professor Huxley finds in their crania, as in those of the other dolichocephali of Western Europe, Australian affinities, though without deciding on "the ethnological value of the osteological resemblance."

XIV. In conclusion,—I am content with having established, from archæological and osteological data, at least to my own sa-

tisfaction, the existence, in this Island of the West, of two distinct races in pre-Roman times. One of these, I may repeat, which had lost its supremacy, at least in the south of the island, being the earlier and dolichocephalic, was probably Iberic; the other, being the later and brachycephalic, was probably Gaulish or, in other words, Belgic.

IV.—*Elasticity of Animal Type.* By C. W. Devis, B.A., F.A.S.L.

There are salient facts in the Natural History of Man which, to most observers, seem to belong to man's nature alone; or, at least, to be there comprehended in a measure so superlative, as to confer upon them the rank of human peculiarities. Man, it is said, is especially characterised by these, among his other faculties—a power of perfect adaptation to climatic changes, and, therefore, of unlimited expansibility over the earth's surface, and, as a sequent of both, corresponding inconstancy of form, physical and mental; further, by a normal tendency to find his highest level under artificial conditions of life. Though it is pretty certain that more than one of these so-called characteristics have been greatly exaggerated by controversialists, still there is little doubt that they are possessed by man in no little strength. There is, indeed, reason to think that the undeniable existence of these faculties has exercised more than its due influence over the formation of even scientific opinion as to man's zoological status. In the early modern period of physiological study, research was almost exclusively confined to the human frame; and its deductions were unaided by a knowledge of the range and convertibility of the physical forces. To this era is to be attributed the origin of a hypothesis of life which clings tenaciously to the minds of the passing generation, especially to those of a metaphysical complexion. In accordance with the mental custom of exalting all unknown causes to supernatural dignity, one of the first results of observation upon organic operations, was the invention of a special commissioner, a *deus in machinâ*, charged by the First Cause with the general superintendence of the body—elaborating its structures, energising its organs, repairing its injuries, resisting its proneness to decomposition, and acting throughout, not merely irrespective of, but in direct antagonism

to the forces which regulate inorganic phenomena. For this hypothetical creation various names have been devised by the fancy and requirements of believers, from the "animating principle" (one to each animal form) of Aristotle, reproduced in the "vital forms" of the present Scotch school, to the "organic principle," "nisus formativus," "vis medicatrix naturæ," of latter-day observers, and the "vital spark" and "living soul" of the rhapsodist. The presence of such a delegate being assumed, it was easy, perhaps necessary, to suppose that any constitutional peculiarities observable amongst animals must be due to the inherent capacities of their "living principles." The obvious existence of a natural scale of organisation seems to have suggested the idea that the gradual complication and intensification of the bodily functions indicate a corresponding exaltation of the immaterial "principle," to which they are subservient. But as these manifestations of organic activity show that the whole animal becomes more thoroughly independent of external conditions, and, consequently, more at liberty to amplify the special characters of its organism, it was concluded that in an inferior susceptibility in the individual to injury from change of circumstances, and greater capacity in the species to spread out in form or locality, we have evidence of "vital principles" of a superior nature. Let us further assume that the human group of animals exhibits in these respects, that is, in its tolerance of physical change, and in the great variety of form which it presents, a positive and inexplicable contrast to the absence of similar characteristics elsewhere; and let us attribute the supposed fact without reserve to the pre-eminence in man of the "psychovital element," and we are once more led to that impassable gulf between man and beast in which so many have lost their tempers. If, however, it should be found, on examination, that these, together with depending characters, are so far from being peculiar to man, that they exist in a high degree of perfection among lower animals, we shall rather be disposed to refer them to some intelligible law of organisation affecting animals of very different grades alike. Whatever the nature of the organising force, whether autocratic, or merely one of the modifications of the general motor, its most per-

ceptible result is differentiation of form and constitution: in view of the correlation of animal life with its means of sustentation, perhaps we may say it is the most inevitable result. Among the invertebrates dissimilarity of form is chiefly specific. We are overwhelmed by the almost incalculable multitude of species; we find it difficult, for the most part, to distinguish between individuals. In the higher classes, especially the Hæmatotherma, the species are comparatively few; individual differences are much more remarkable. Taking the mammalia as a class, it is easily observable that individual dissimilarity is by no means constant in its value; that in some orders and families it is much more obvious than in others; and that, while this is true of animals in their natural state, the tendency to differentiation is increased under artificial influences, a horse or a dog being scarcely less individualised than a member of the human group. In the case of man, this diversity, which so peremptorily arrests the attention, has been referred to many causes, reasonable or amusing, as authorities varied. Among the agencies producing variation, a prominent place has justly been assigned by Gliddon and others to hybridisation; and there are considerations suggested by this faculty which may justify us in making it a centre-point round which to group the other characters which await review.

Although there are, probably, few men of science with whom the idea lingers that fertile interbreeding demonstrates identity of species, it is, notwithstanding, felt by many that the great power of interproduction probably possessed by many forms of mankind, obstructs the reception of the theory of multiple species; and, though the plurality of human origin, towards which so many lines of proof converge, neither affirms nor denies the doctrine of specific unity, the opponents of the former lean with misplaced confidence upon hybridity as a test of the latter. As a natural consequence, human hybridibility has been alternately vaunted and depreciated by conflicting expositors of man's origin and specific value. Disputants have made frequent appeals to zoology, without, however, eliciting any very satisfactory results; perhaps because the facts adduced have been chiefly derived from instances of intermixture

afforded by a few of the domesticated animals. Not improbably, a wider survey and stricter analysis of the phenomena of hybridisation may eventually result in the discovery that some general relation in respect to it exists between various groups of animals; and further, that such a relation may distinctly include man within its terms. It is very frequently supposed, either that animals in their natural state afford no indications whatever of hybridising propensities, these being assumed to be the abnormal effects of the artificial conditions to which they are subjected by their association with man, or that the inclination and the power subsist at a low and dead level. It is true that the greater number of observed instances of fertile intermixture happen in domestication, and necessarily so; but we are by no means without evidence that the arrangements of the experimentalist, though favourable, are not essential to hybridity. Intermixture, again, does undoubtedly takes place more or less completely in a great variety of animals; moderate inquiry, however, will convince the zoologist that it occurs in much greater proportion and strength in some groups than in others. As this fact forms the pivot on which the present inquiry turns, it will be necessary to substantiate it by a detailed arrangement of the instances of hybridisation commonly known.

In all discussions of this question, it is necessary to bear in mind that hybridity, taken as an index of specific value, is, in every case, a varying quantity, depending partly on the degree of affinity, whether proximate, or more remote of the species in question, and partly on the degree of hybridibility mutually possessed by them. This may rise to its perfection in the capacity to produce offspring indefinitely fruitful among themselves, sink to its zero in the mere impulse to coition, or exist in intermediate grades. The offspring may be fertile only with the parent stocks; or two species not known to hybridise *inter se*, may do so by the medium of a third, whose product from each of the others, propagate between themselves; or the offspring of two species may be fertile with a third; or finally, they may be altogether infertile. Although our interest is especially excited by examples of the higher grades, even the

lowest of them is of considerable value; for if largely yielded by many different species of a family, it gives an important indication of the existence of a natural disposition to intermixture, and suggests an investigation into the causes which may have led to an arrest of hybridibility at this stage.

Confining our attention to the division of animals with which man is more immediately associated, the warm-blooded vertebrates, and glancing over these forms of life from the lowest of them upwards, the group which first comes under notice is that of the anserine birds. Until we arrive at the geese and ducks, no evidence of prevalent hybridisation occurs in any aggregate of species; in this, the indications are unmistakeable. The following list, capable, no doubt, of being increased by many readers, shows the extent to which this family of birds is known to interbreed:—

The common goose breeds with the	Hooper swan.
„ „ „ „	Chinese goose.
„ „ „ „	Canada goose.
„ „ „ „	Bernicle goose.
„ „ „ „	White-fronted goose.
„ „ „ „	Bean goose.
„ „ „ „	Wild grey lag goose.
„ „ „ „	Knobbed goose.
The Egyptian goose „ „	Chinese goose.
„ „ „ „	Spur-winged goose.
„ „ „ „	Common duck.
The Canada goose „ „	Common goose.
„ „ „ „	Chinese goose.
„ „ „ „	Bernicle goose.
The Bean goose „ „	Pink-footed goose.
„ „ „ „	Common goose.
The Bernicle goose „ „	Common goose.
„ „ „ „	Canada goose.
„ „ „ „	White-fronted goose.
„ „ „ „	Pintail duck.
Mule from Egyptian & Canada Geese, do.	Common duck.
The Common duck breeds with the	Muscovy duck.
„ „ „ „	Sheldrake.
„ „ „ „	Pintail.
„ „ „ „	Widgeon.
„ „ „ „	Teal.
„ „ „ „	Indian black duck.
„ „ „ „	Egyptian goose.

The Pintail Duck	breeds	with	the	Common duck.
„	„	„	„	Widgeon.
„	„	„	„	Scaup.
„	„	„	„	Bernicle goose.
The Shoveller Duck	„	„		Garganey teal.
The Scaup Duck	„	„		Pochard.
„	„	„	„	Pintail.
The Ferruginous Duck		„		Pochard.
„	„	„	„	Tufted duck.
The Common Swan	„	„		Polish swan.
„	„	„	„	Black swan.
„	„	„	„	Common goose.

An analysis of this list shows that of the comparatively few species which ordinarily come under observation, no fewer than 28 breed together to an extent varying from one to seven species; and that the intermixture is not confined within generic limits, but is exemplified between swans and geese, geese and ducks. Passing on, no example of hybridity causes us to halt before we reach the rasorial tribes. Among these, a large group, containing the pheasants, partridges, fowls, and grouse, give unequivocal evidence that they are naturally disposed to intermixture. We find that,—

The Common Pheasant	breeds	with	the	Ring-necked pheasant.
„	„	„	„	Golden pheasant.
„	„	„	„	Silver pheasant.
„	„	„	„	Black grouse.
„	„	„	„	Guinea-fowl.
„	„	„	„	Turkey.
„	„	„	„	Fowls of various kinds.
The Black Grouse		„		Pheasant.
„	„	„	„	Capercailzee.
The Common Fowl		„		Pheasant.
„	„	„	„	Capercailzee.
„	„	„	„	Partridge.

Fowls of all species breed one with another. The ten species here named are, therefore, exclusive of the several distinct species of fowls, whose capacity for prolific interbreeding has stocked our poultry-yards with mongrels innumerable; were these enumerated, the number would be raised to about eighteen. As the list includes by far the greater number of the species of this family familiarly known to us, it is clear that a strong, and in many instances, an effectual tendency to commixture must be attributed to the group.

After a wide interval we meet with a similar disposition displayed in a family of the insessorial birds, the finches. Taking the canary as a centre, and Bechstein as an authority, confirmed, however, by the experience of breeders, we find this bird commonly hybridising with its kindred, the goldfinch, greenfinch, siskin, linnet, sparrow, bullfinch, &c. Whether the mules from the last-named finch are prolific *inter se*, is yet undecided; with respect to the rest such appears to be the case to a greater or less extent, and there is reason to believe that the prolificacy is proportionate to the affinity of the species associated, and obtains both between the progeny of several stocks and that of any one stock with the canary. Not only, then, do these finches hybridise with the canary, but, through the offspring so obtained, with each other. Their direct hybridibility is instanced in the case of an intermixture of the wild goldfinch and greenfinch. Although a few remarkable instances of natural hybridisation have been observed to take place between birds belonging to other groups, the song-thrush having been known to breed, in three instances, with the blackbird, and in one of them for successive years, and the hooded and common crow being frequently thus associated, there does not appear to be another example of an inclination to or capacity for intermixture running throughout a family.

In the mammalia we find that the groups conspicuous for their facility of interbreeding are much more numerous. The first presents itself in that great section of the hollow-horned ruminants which includes the goats, sheep, and oxen; the illustrations being most frequent among the former two. Not only are all forms of the domestic goat, whether of our own or of foreign stocks, intermiscible, but they are capable of producing with various wild species. Bell, in his *British Quadrupeds*, is of opinion that "the large goats which are reported to have been brought from the Alps and the Pyrenees to the Garden of Plants at Paris, and which were stated to have been wild, were probably the progeny of the Ibex with the common goat." These hybrids were found to be capable of interbreeding, but to what extent is not recorded. Hodgson tells us

that the wild Jhâral of Nepaul also breeds with the domestic goat. The hybridibility of the Cashmere goat is shown by the permanence of a Tartar half-breed of that species, and the fact that both species of Ibex, the common and the Caucasian, breed readily with the reclaimed species was well known to Cuvier. The moufflon is known to breed with the common ewe, but the hybridibility of the various species of sheep does not seem to have excited much experimental attention; their fertility with each other may, however, reasonably be taken for granted, as we find that the faculty overpasses the somewhat indistinct line separating the two genera *Ovis* and *Capra*. There is sufficient evidence that the domestic goat will breed successfully with the sheep. F. Cuvier states that the mules are fruitful, but reproduce with some difficulty. Chevreul, however, speaks of the practice in Chili of crossing sheep with goats in order to modify the fleece; a process which would seem to require continuous production. Cretzschmar obtained a cross between the Cashmere goat and the Saxon merino, while Cuvier says of the relation between sheep and goats that "they so little merit to be generically separated from each other that they produce by intermixture fertile offspring." This, it must be observed, was written under the impression then commonly felt that non-hybridity is the test of distinctiveness; a proof liable to result in a *reductio ad absurdum*, for in these animals hybricity ranges even into a distinct family. Hellenius (Gliddon, *Types*) has recorded in the memoirs of the Royal Swedish Academy of Stockholm the details of a fertile intermixture of the ram with the female roe. He was successful in procuring two generations of hybrids *inter se*, besides other mixtures of the mules with the parent stocks. As to the oxen, direct evidence is more scanty, yet there is enough to show that a similar disposition prevails amongst them. Instances of hybridity between the zebu and gayal of India have been observed, and even the American bison is known to reproduce with the common cow; but it is said that their offspring are infertile. Indeed, the hybridibility of the ox tribe does not at first sight seem to be equal to that of the sheep and goats. This, however, depends upon a hypothesis, of which there is no proof,

that all forms of domestic cattle are derived from a single source. If we owe them, as we certainly do other domestic animals, to two or more distinct stocks, their interprolificacy is *ipso facto* established. The next well-marked instance occurs in the hog family. The genus *Sus* has been reclaimed from Britain to China, and the variations produced by intermixture are innumerable. The Chinese pig, a distinct species, breeds unhesitatingly with the western hogs. Science, however, awaits information respecting the hybridibility of some outlying forms, as the Papuan and Japan species; and that of the Wart hog, or the Peccaries, with the true pigs. In the horses, again, the indications of a general tendency to hybridization are too strong to be overlooked. Not to venture upon the harried ground of origin, we may, at least, affirm that many well-defined forms of horse have retained their peculiar characters from pre-historic eras; and, by virtue of permanence of type, must be held to be distinct species. It is scarcely necessary to add that all these, from the British pony noticed by Cæsar to the giant Belgian and the graceful Arab, hybridize, without exception, in the highest degree. Even the cognate genera are very prone to intermixture. The ass, the zebra, and the quagga readily breed with every species of horse. The general infecundity of the mules, arising from the first of these associations, is not surprising, considering the distance which separates the ass from the horse. A much more promising field of experiment would be found in the zebra. It is scarcely doubtful that they would prove to be interprolific. In the digitigrade division of the Carnivora there is a group, the *Mustelidæ*, which affords indications of hybridibility, at first sight unimportant, but valuable when taken in connection with characters to be subsequently considered. It is difficult to see on what grounds the specific distinction of the polecat from the ferret is ignored by some naturalists, when it is established by every necessary character, and contradicted by none except albinism. These animals breed together with facility, and the cross is readily and frequently perpetuated for the purposes of the gamekeeper and others. In the absence of systematic experiment, our knowledge of the miscibility of the larger felines is very limited.

The lion and the tiger often hybridise in confinement; the young have been reared to maturity, but there seems to be as yet no observation as to their fertility. The opinion is now prevalent that it is to a mixture of several distinct species of the smaller cats that we owe the origin of the domestic hybrid; if this be correct, and the sole original of our familiar has never yet been produced, it follows that several species of the genus interbreed with the production of a perfectly fertile offspring.

But of all others, the most important group of animals in reference to hybridibility is certainly that of the canine digitigrades. In this family we have a grading series of wolves, dogs, agúaras, jackalls, and foxes; in all these the susceptibility of hybridisation crops out more or less conspicuously. We do not require isolated experiments to assure us of its presence in the wolves. It is sufficient to refer to the well-known fact that their reclaimed forms in the huts of the North Americans have produced among themselves several races of hybrids, known as dogs, retaining more or less of the lupine aspect, and sometimes bearing marks of vulpine admixture. It is almost superfluous to say that the true dogs interbreed most perfectly, both the specific forms whose permanence of type is vindicated by the records of five thousand years and the mongrels rising before our own eyes. The wolves breed with the dogs, not only intermediately through the domesticated American wolves, but directly one with another. Pallas, indeed, affirms that the wolf-dog of Europe (*C. Pomeranius*) is a hybrid race, derived on the one side from the black wolf (*C. Lycaon*). The agúaras of South America and the West Indies, a genus *Dasicyon*, nearly midway between dogs and foxes, produce with the former an offspring perfectly fertile; though it is said that the union takes place with less facility than amongst the dogs themselves. The dogs and foxes, again, breed together, as is proved, not merely by occasional instances within our own experience, but from the fact that the Spartans cultivated a race of fox-dogs (*Alopekides*) which must certainly have been prolific, otherwise they would have been under the necessity of constantly procuring wild foxes to keep up the breed. The dog and jackal also interbreed; but, though the fact is ascer-

tained, the degree of which the intermixture is capable has not been determined. It is impossible to do more in a few sentences than summarise the multitude of observations on record respecting hybridity amongst the members of the dog family; enough perhaps has been said to show that the faculty of interbreeding exists in it to an extent which seems scarcely capable of limitation. One other group now remains, that of the monkeys. The monkeys proper, and especially the simian division of them, occupy a conspicuous position in the lowest degree of the scale of hybridity, but occasionally they rise above it. It is a matter of ordinary observation that these more anthropoid forms exhibit in confinement a laxity in their reproductive inclinations, which not only renders them irrespective of seasons, conformable therein to man, but allows their proclivities to be displayed to the utmost stretch of communism; and by many of them even towards the human female. The mandrils, for example, manifest so strong a disposition in the latter direction, that travellers' tales about ourangs and native women are perhaps worthy of more credence than is generally allowed to them. In our latitudes, and in the cages of our menageries, it is probable that the facilities for interbreeding afforded by the association of species, are counteracted by climatic and other negations; and it is also possible that many cases of hybridity amongst them are lost to science. Two instances of it between animals of different genera have fallen under the writer's observation; still, it is pretty certain that in confinement the monkeys do not effectually hybridise to any great extent, notwithstanding the strong disposition thereto constantly exhibited by them.

From the facts adduced, incomplete as the collection necessarily is, it may have become evident that we have no reason to regard hybridisation as on the one hand an unnatural, or on the other a common diversion of generative methods. Whatever tendency there may possibly be to the obliteration or modification of specific forms from this cause, it is certainly not equally obvious in all vertebrate groups. Many, most, perhaps, give no recognisable indications of it at all; in many other instances, they are unfrequent and widely isolated; while in the families

referred to, the ducks, fowls, finches, sheep, goats, oxen, horses, cats, dogs, and monkeys, we have found the hybridising impulse more or less active and universal. To popular apprehension, cases of hybridity are simply matters of curiosity, meaning little or nothing; and were they irrelative facts, mere eccentricities, even the zoologist might be excused if he passed them by as well-nigh valueless to science. This, however, is far from being the case, for, on examining further the natural history of the families in question, we discover that the tendency to hybridisation is constantly associated with a series of other characteristics, predicable of them only, or at least possessed by them to a far greater extent than by others. A review of these characters may possibly enable us to decipher the principle which renders them mutually dependent.

The family of the geese and ducks comprises a large number of species, many of them of very close affinity. It possesses a vast geographical range, not confined to a single zone, but extending to very varied climates, and therefore subjecting them to the utmost diversity in physical conditions. The readiness with which nearly all the species which have been tried submit to domestication is a matter of ordinary experience, and in this state they flourish in whatever localities they may be placed. The variations developed in the domestic stocks are extremely numerous; although, we may observe in passing, the mallard, from which its origin is commonly deduced, does not seem to break into varieties when kept isolated for a long period. In the rasorial group we meet with the same set of characters. The typical poultry, indeed, so perfect in their hybridibility, are restricted, in their natural range, to Eastern Asia; but, on the other hand, no animals show greater submission to change of circumstances wherever, within moderate temperatures, they may be transported; and there is amongst them very close specific alliances. Of the feathered hosts peopling the woods, no group can exhibit a greater number, or closer approximation of species, or wider extent of distribution, than the finches. None supplies so many songsters and pets to our cages. The sparrow on the house-top proves that in one case, at least, domesticity is a natural inclination; the canary evidences the

proneness of domesticated species of the family to sport into varieties. In the ruminants, to which reference has been made, the same series of facts appears in high relief;—a large number of intimate species, extensive range, easy reclamation, and abundant variability. "No animal," says Pennant, "seems so subject to variation (the dog excepted) as the goat, nor did its multitudinous transformations escape Pliny (lib. 8, c. 53)." Cuvier observes that the domestic goat varies infinitely in stature, colour, length and fineness of hair, and in the size and number of its horns. The family is spread over Europe, Asia, and North Africa, and, in osculant forms, North America. The near affinity of several of the species, proves a great stumbling-block to the systematist. The same observations would have to be repeated, if necessary, in the cases of the sheep and oxen. If, again, we turned to the horses and the hogs, we should find that the characters enumerated are exhibited by these families in a much greater degree than in any other group belonging to the pachydermatous order. But nowhere is their concurrence so remarkable as amongst the dogs. The typical dogs are now cosmopolitan; the wolves and foxes nearly so; the jackalls are widely spread over Africa and Asia, and whilom Southern Europe; the agúaras alone, a small and transitional genus, are comparatively restricted. Of the near affinity of the dogs one to another it is superfluous to say a word: that of the wolves is best seen in the difficulties experienced in separating the species of America from those of Europe, those of either continent from each other, and varieties from species throughout. To a smaller extent, the foxes and the other genera of the family, present like obstacles to an exact registration. The North American tribes have habitually taken advantage of the readiness of the wolves to submit to domestication. The eight varieties of the black wolf and the five varieties of the grey, testify to their tendency to originate forms, apparently new, even in the wild state. A domestic disposition cannot, perhaps, be attributed to the foxes and jackals, but the agúaras were found by Columbus in a reclaimed condition. The high degree of perfection to which these characters of geographical expansion, multiplicity of species, variability, and domesticity,

attain in the true dogs, is apt to divert our attention from their congeners. It is, however, difficult to study the whole family with much care, and resist the conviction that it exemplifies in a pre-eminent degree the natural association of characters which we have been led to recognize in other groups. A further illustration, of limited extent, occurs in the weasel tribe. The intermixture of the polecat and ferret has been mentioned. The numerous species into which this family ramifies are so intimately connected, that the latest effort made to distinguish between them, is, in many points, very unsatisfactory; and much remains to be done before their differentiations and specific values can be regarded as established. In many of these animals we are perplexed with a large amount of variability; some of them, the martens notably, enjoy a very extensive geographical range. The same remarks will apply to the smaller cats, with the addition that these animals seem to be naturally inclined to associate with man. In the monkeys, we are once more able to define the same series of characters, though in some respects they are modified. The monkeys are known to us in a large number of specific forms, whose boundaries are frequently indistinct; the uncertainty arising from close relationship being increased by the frequent occurrence of apparent varieties. The group possesses a wide longitudinal extension in Asia, Africa, and America, but its latitudes are almost restricted to tropical and sub-tropical zones. Young cheiropoda are nearly always susceptible of human attachment and discipline; the higher forms, as the chimpanzee, seem to acquire human habits spontaneously. It is difficult to form an accurate estimate of the domestic disposition of the whole family, but probably it is not strong; and weakness in this character is accompanied, as we have seen, by limitations in superficial range, and a comparatively low degree of hybridibility.

The intensity which characterises the possession of these faculties by the canidæ, is paralleled in one other group only, that of man, whose diffusion, adaptation to varied conditions of existence, number and affinity of forms, and tendency to an artificial life and hybridibility, place him in the same category.

It is not within the present scope of the writer to discuss the measure in which these faculties are possessed by mankind, or the circumstances by which they are favourably or adversely affected. The usual account given of them is assumed to be correct.

The facts adduced, subject, here and there, to slight modifications, will, perhaps, justify the conclusion, that in the birds and mammals a certain set of idiosyncracies are, generally speaking, associated together, and mutually dependent, and that they are not of uniform occurrence throughout each class, but are, as it were, concentrated in particular groups, which have no other connection with each other than the possession of these peculiarities.

All this seems to imply, that in such groups there is an inherent flexibility of constitution, permitting the individual to endure a certain degree of modification in two different directions; in the one rendering it possible for it to yield to the effects of changes, whether of climate or habit, in the other allowing a greater or less license in the working of the strict rule of specific generation; a relaxation which results, not merely in the grosser production of intermediate forms by intermixture, but in a tendency to produce variation within the proper limits of the species.

However sufficient may be the facts whereon our argument is based, a strong confirmation of its general truth is afforded by the negative evidence of several cases in which the characters under consideration are almost or entirely deficient. The camels, whose whole genus consists of two species, widely separated as to structural characters from their nearest kindred, the llamas, their range confined of old to the sandy plains of Asia, and extended in comparatively modern times to those of Africa, have been reclaimed and assiduously cultivated from ante-historical ages, yet we see no hybrid races resulting from intermixture of the species, and no acquired variability compensating for natural uniformity. The swift dromedary of the Arabs differs from its companions only in its lighter frame. The Asiatic elephant again, one of two species, constituting an isolated group without natural varieties, and restricted to the

African and Asiatic tropics, though bred in domestication from a very remote period, has not sported into new forms. Certain elephants are appropriated to certain uses, for which their individual shape and disposition may be fitted, but permanent varieties in any way corresponding with those of horses or dogs have never been established. So it is with the reindeer, the instrument of man from post-glacial times, and the only species of its genus. Two or three nominal varieties of caribou are nominally and vaguely distinguished, but the intense domestication to which the animal has been subjected for thousands of generations has failed to produce anything analogous to the variations exhibited by animals familiar to ourselves. In all these instances, and we may add to them the llamas of South America, fewness of species preventing the interfusion of many bloods, and a low capacity for variation, natural or acquired, are accompanied not merely by a very limited geographical range possessed by the animals at the present time, but by evidences of a want of adaptive power which renders their subservience to altered conditions almost nil. The reindeer has been gradually driven back by geological changes from latitudes now temperate to those still arctic. The elephants have, in a similar manner, retired to the tropics of the Eastern hemisphere, and died out completely in the West; experience showing that they are now incapable of propagating far from the equator. The introduction of the camel into the West is a failure; its permanent acclimatisation in Australia, though possessing, perhaps, more of the elements of success, is still a problem: that of the llama into the same country is already found to be surrounded by apparently insuperable difficulties.

The mutual dependence of the characters under notice is placed in a strong light by the cases now cited. They show how little variability is effected by domestication or change of circumstances merely; how much it depends upon the concurrence of several constitutional prerogatives of the family rather than of the individual. Whether domestication combined with change of habitat would, in such a case, *e.g.*, that of the reindeer, be more effectual, cannot be experimentally proved, as the experiment would be precluded by the want of adapta-

tion. It is observable that among domesticated animals the least variation takes place in those whereof but one species has been reclaimed. The guinea pig, for example, sports only into parti-colours; so with the pintado and the turkey. The ass, again, preserves, even in its most cultivated breeds, a surprising uniformity. We have here presumptive evidence that variation results rather from a contact of species than from the accidents of individual circumstance.

The existence of natural hybridisation, observed, indeed, comparatively rarely, but occurring unobserved we know not how often, is a very suggestive fact. It not only loosens our ideas of specific exclusiveness of generation, previously undermined by experiment; but it leads us to ask, whether it be not a natural process in force beyond what we at present imagine, and whether the fine gradations between species which so often puzzle the naturalist, more especially the ornithologist and entomologist, be not in part due to this agency. At least it shines through, if not dispels, another portion of the theocratical mist wherein the early cultivators of zoology worked; we can scarcely echo Blumenbach's sentiment that specific generation is an arrangement of providence for the conservation of species, except on the inadmissible supposition that providence can countermand itself.

The characters which we have been led to associate together in reference to the life groups brought under consideration, appear to consolidate themselves into two propositions predicable of those groups. A great extent of geographical range, combined with an adaptability to a variety of natural conditions, and a proneness to domestication, seem to indicate a general submissiveness to external agencies. A large number and close relationship of specific forms, a disposition to hybridibility, and a facility in sporting into varieties, may together be considered as indicating an expansion of the modes of specific production ordinarily recognised. A step further may safely be taken. We may infer from the data before us that the groups in question, and any others to which the same series of characters may be found to belong, possess them in order to enable them by their mutual reactions to occupy the widest

extent of surface by the greatest multiplicity of forms in the most vigorous life whereof their present constitution is capable; and it is scarcely venturing into the realms of speculation to say, that an expansive constitution like this must be the seat and instrument of the greatest amount of the vitalising reactions.

If this be a correct statement of facts observable in nature, it only remains for us to search for the cause to which the effects may reasonably be attributed. What, then, is the principle regulating the possession of such a constitution? The clue to it appears to be afforded by one of the animals whose cases have been cited as confirmatory evidence,—the elephant, —but it is a clue which must be traced backwards into the byegone history of animal life. The study of organic life leaves no room for doubt that the existence of every group of animals, whether coterminous with the great divisions of vertebrates and invertebrates, or with the gradually subordinated sections into which they arrange themselves, has a definite duration in time. At a superficial glance it might, indeed, appear that the greater divisions, especially that of the invertebrate animals, have preserved a continuous existence from their first appearance, as the whole number of forms comprised in them does not seem to have been greater at any former time than at the present day; but we are quickly assured that though they continue, they continue by virtue of frequent changes effected in their composition; the inconstancy being, perhaps, greater as the animalisation becomes more highly elaborated, and its effects being clearly perceptible, whether we compare the two sub-kingdoms, or the higher and lower members of each, with one another. It is not necessary here to discuss by what mode the changes have been effected, or whether they have or have not, on the whole, tended to render the sum of animal life more perfect; it is sufficient for our present purpose to accept the truth that such changes have taken place from the beginning, and from the constancy of natural operations to deduce the reasonableness of the belief that they are still taking place. The changes have never been complete; that is, affecting every portion of a group at the same time; but partial, and,

so to speak, fitful, reminding us of waves rising and falling upon the surface of the advancing tide. As we examine the strata, we encounter at every step forms of life starting into existence in various directions, rising to their respective summits, and subsiding as they approach higher levels of time. The *Pterodactyls, Enaliosaurs, Dinosaurs, Ammonites,* and *Trilobites* are among the well-known instances of large groups, whose history belongs entirely to geology. A list of the smaller groups, known as genera and species, whose birth and death are registered in the rocks, would be simply wearisome. We need but to reflect that, even among the lower and more permanent classes, the cases of identity between past and present forms are but rare, and growing rarer under investigation, and we shall be assured that every type of animal has a life time; subject, no doubt, to premature interruption, but, generally speaking, running its due course. It is an ordinary expression that a certain group flourished at a certain time. What criteria lead us to this conclusion, or enable us to denominate a given era according to its prevalent types, as the age of reptiles? briefly these, a culmination in the number and variety and, oftentimes, magnitude, of the forms presented by the type, preceded by an increase and followed by a decrease of those characters, accompanied, moreover, by an expansion and subsequent contraction of the space of land or water occupied by them. By the application of the same criteria to groups at present existing, we are justified in asserting positively that they are of very various ages. Many of them commenced their life at remote periods, and at after epochs stored the rocks with remains of species and genera vastly outnumbering their existing forms, and that frequently in latitudes which would be fatal to their remnants. Such were the marsupials, edentates, and pachyderms of the mammalian class; it is therefore no metaphor to say that such groups as these and the struthious birds, the lacertian lizards, the armour-plated fish, the brachiopods, echinoderms, and crinoids, are dying of sheer old age—once potent in all respects, their numbers, diversity, physique, and expansiveness, have gradually dwindled; they now linger in decrepitude, shadows of their former selves—their decease,

sometimes hastened, sometimes hindered, by human agency, cannot be very far distant.

We discover in this manner that homological investigation is as applicable to the vital as to the structural characters of animal groups. The regular progression and duration of life proper to the individual of a species are, with necessary modifications, exhibited by that and every natural aggregate; birth, youth, maturity, decay succeed each other; the dead do not rise again, and adolescence is characterised, as we have seen, by those vital manifestations which are familiar to our own experience,—the restless diffusive temper, the keen impulse to propagation overstepping the limits of ordinary associations, the consequent differentiation of features, the facility of preserving and even of enjoying life under circumstances before which the stiffness of age would quail and succumb. This pliability of temperament, this power of yielding to tension put upon the physical structure, this readiness wherewith the functional organs modify their tone in accord with the exigencies of the new situation, may be termed *elasticity of the animal type*, for in whatever degree or direction the changes may be traced, whether in the rise of new features harmonised to climatic variations, or of forms altered by the contact of different species, or elsewise, the normal characters though strained are not destroyed, and the adaptive nature of the changes is shewn by the tendency of the type to return to its simpler forms when the conditions are simplified or the energies reduced. We may here remark that the term elasticity, in the sense proposed, is consonant to, and indeed required by, well-known facts; *flexibility* of type, implying a permanent alteration, is known only to theory.

So far the whole result attained is that the presence or absence of numerous, varied, and vigorous forms, extensively diffused, inclined to acquired habits and hybridisation, is due in any group to the time of life to which it has reached,—in other words, to the principle of maturation, the law or laws which regulate life processes in the several stages from germination to death.

If we are correct in attributing the phenomena associated

under the term elasticity to the degree of maturation, it is clear that the history of man ought to supply facts in confirmation; the description should be equally true in the case of man as in that of the lower animals; for, whatever our opinions are as to his supra-material nature, the characters whereon depend his occupation of the earth are fundamentally physical, and in his physical properties he is altogether an animal. The main facts at present ascertained in respect to the past life of mankind as a whole strongly illustrate our proposition. Nothing appears more certain than that mankind has passed through late geological time in a very low phase of existence; that we are not yet acquainted with his primary state no unprejudiced inquirer will see reason to deny. The general similarity, almost identity, of the earliest industrial remains of man, wherever discovered, has excited no little attention; its most natural explanation is found in the uniformity of wants and capabilities characteristic of the infant state; traced upwards in archaic history, the development of mental power is best seen in the diversity of character which has left its impress on human works. Whether this was accompanied by corresponding variation of form cannot be affirmed until the comparative osteology of the earliest, and of subsequent, races has accumulated materials for judgment. During historic times the group has been composed of a number of distinct races, far greater than the earth could have seen at the origin of the type; in its present stage the typical characters, intellectual and physical, are at an altitude previously unattained, but we have no reason to think that the group as a whole is at or near its zenith.

In following downwards the traces of this principle, from the whole group to its subordinate sections, it is necessary to bear in mind the mode wherein it affects similar subdivisions of the lower animals. Groups of like artificial value, as families or orders, differ, as we have seen, among themselves in their indications of life development; and as such groups are but the individuals of higher aggregates, so their own subdivisions present similar diversities. At every period of its lifetime, a family, for example, may and does comprise genera and a genus species, in various phases of the type growth of the aggregate

of next greater value—the oldest of these, that which possesses the greatest typical capacity, may or may not be the youngest in point of time; the youngest, sometimes so immature as to render its real type doubtful, may be amongst the oldest members of the family. This is, indeed, in accordance with the observation that the lower the standard of possible attainment, the sooner it is reached and the longer it is preserved unimpaired. The history of a natural family, though on the whole clearly showing progress upwards, by no means presents us with a consecutive series of genera arising one from another, and each exhibiting a measure of improvement upon its ancestor; much less does it teach us that each genus can, and therefore does, develope within itself the highest characters of its type; we observe, moreover, that each group having completed the cycle of development proper to it, necessarily perishes and its place in nature is supplied, generally speaking, by something better. Human developments form no exception to the order observed elsewhere in nature, and we have abundant evidence in the history of races that the laws of maturation are, and have been, constantly influencing their rise and fall. Some still existing are perpetuations of the infancy of humanity, and perishing therein as still less mature, man, on whose ground they tread, has perished before them; some are, or have been, characterised by the graces, inquisitiveness, and credulity of childhood; a stage whereof the ancient Greek perhaps afforded the full type. Others we see in their incipient maturity, a grade of development not exemplified in the previous history of man, vigorous, domineering, propagative, outspreading, adapting themselves readily to unwonted circumstances, mixing their blood with that of every race in contact with them, even while they crush them out of existence, varying infinitely among themselves in feature and temperament, holding themselves loose from those ties which so strongly bind down other more immature types to their soil and customs. In short, it is in these especially that we recognise a degree of elasticity of type, for it is in these that the characters leading to its recognition exist in the greatest force yet known.

The most general and most fatal hindrance to the elevation

of a race above its natural level is want of adaptability. Immaturity in this respect not only renders the physical powers more susceptible of injury, but prevents the intellectual from obtaining that mastery over external conditions which brings them within the limits of endurance. Among such races medical practice, sanitary provision, engineering, and even domestic arts, are but imperfectly comprehended and rudely exercised. One of the irrepressible outcomes of propagative expansiveness, whether in human or other races, is colonisation, at once the index and the means of increased development. This, which must not be confused with migration, is exemplified in races such as the old Roman and modern European in a degree unapproached elsewhere; in other races fixity is associated with exclusiveness, and exclusiveness is but another word for stagnation.

If the several grades of development be the products of a natural law such as that which I have endeavoured to point out, it follows that in any type or race the proportions wherein the characteristics are inherent cannot be materially and permanently altered; and as this deduction is confirmed by experience, we are compelled to refuse assent to the hypothesis that every individual, and, collectively, every race, is capable of indefinite improvement. This supposition implies that every race possesses the elements and potentiality of human development in full perfection, and merely requires impulse and opportunity to vindicate its typical equality. If so it is impossible to account for the indisputable fact that some races *make* the opportunity under their own impulse, while others exist for an indefinite period under the most favourable circumstances and fail to do so. To say that all can be brought up to the same level by education, and are therefore essentially equal in capacity is to pile hypothesis upon hypothesis, it is analogous to saying that every variety of iron may be rendered equally magnetic, and therefore possesses the natural properties of a magnet. It ought not be objected to the principle of life stages, that in practice it would render our conduct towards more immature races fatalistic, prevent all effort tending to their cultivation, from a conviction that such endeavours must necessarily be

futile. Education, the communication of experience from the elder to the younger, notwithstanding the imposing titles given to it by doctrinaires, is simply a natural impulse known to be obeyed by other animals than man; and since we are educators by nature, the effect of education, experience communicated, is a natural sequence; farther, since the limit of possible education is determined by the degree of maturation, we have sufficient reason to attempt the improvement of a race in the hope of thereby ascertaining its maturity where unknown. Benevolence frequently wonders why so little fruit springs from its golden seed scattered broadcast among the "poor heathen," and complacency is content to ascribe the fact to original sin, or demoniacal agency, both particularly rife among savages. Were a competent acquaintance with the human constitution one of the accomplishments of the world's civilizers, they would understand that the rational habits of thought and speech of adult mankind are utterly unsuited to childish races; that the differential calculus cannot well be understood before the multiplication table; and they might be led to suspect that elementary treatment would produce reports perhaps less glowing, but results more substantial. The fallacy of the present system lies in its theory of the fundamental equality of all men. If, however history and experience testify to one thing more strongly than to another it is this, that every race is not capable of attaining the higher phases of humanity. The past presents us with no example of a race pure, exclusive, inelastic in its idiosyncracies, and concomitantly deficient in brain force, developing itself out of itself, or even being capable of education from the savage into the highly civilised condition. This continuous progress takes place in humanity as a whole, not in all its component parts. Be this as it may, that elasticity of constitution which we have traced in various groups of animals, including that of man, and which is itself probably the effect of energetic chemico-vital reactions, is a sufficient explanation of any difficulties attendant upon hybridibility or climatic adaptation, and may perhaps eventually throw light upon the mode of production of those intermediate forms which so often confound specific distinctions, while, at the same time, they cannot be

satisfactorily traced to actual intermixture. The danger of confining the attention to man alone while studying his natural character, and of being thereby led to view him as a kind of pseudo-animal, is strongly illustrated in the case before us; few physical characters pertaining to man have been more frequently quoted as peculiarly human attributes, than the faculties of adaptation and of interbreeding; yet, in these respects, man is at least equalled by the dogs, and the powers themselves are possessed by virtue of a law whose operation is plainly discernible in several other groups of animals. Whatever other foundation they may have, it is clear that neither the doctrine of unique origin on the one hand, nor that of supernatural proprietorship of the earth on the other, can be based upon qualities participated in by other animals.

V.—*Vocal and other Influences upon Mankind, of Pendency of the Epiglottis.* By Sir George Duncan Gibb, Bart., M.A., M.D., LL.D., F.G.S., V.-P.A.S.L., Member of the Royal College of Physicians, Assistant-Physician and Lecturer on Forensic Medicine, Westminster Hospital, etc.

1. In a continued series of experimental inquiries with the laryngoscope, which I have carried on during the last six years, in healthy persons of both sexes, different ages, and varying position in life, some important discoveries were made relating to the position of that remarkable cartilage known as the *epiglottis*. From time to time I have drawn the attention of scientific men to this subject, both in my writings and before societies, but more particularly before the British Association for the Advancement of Science at the Cambridge Meeting in 1862 and at that at Newcastle in 1863, when the normal position of the epiglottis, as described by all anatomists and physiologists before my time, was especially considered.

Up to the period of the Newcastle Meeting in 1863 I had examined 680 healthy persons, and the phenomena observed in them relatively to the position, form, and appearance of the epiglottis formed the subject of my paper. Four years had elapsed since then, and again I ventured to bring the subject before the British Association at its late meeting at Dundee, with an increased experience, founded on an examination of 4600 healthy persons up to the month of September 1867. No excuse is needed for submitting my paper to the consideration of the Fellows of the Anthropological Society, as the subject is one that bears upon mankind in general, and the European races in particular. As my observations will have reference chiefly, indeed almost entirely, to the *position* occupied by the epiglottis, whether vertical and perpendicular or pendent in an oblique or horizontal direction, and the influence which the latter exerts upon mankind at large, I shall endeavour to explain briefly the relative situation of the parts around the

epiglottis, so that every one who is not acquainted with the anatomy of this part of the body, may understand what is meant by pendency of the epiglottis.

2. At the root of the tongue, behind its base, is seen a triangular or oval-shaped cartilage, compared to a cordate leaf, with its edges curved or curled forwards, standing in *an erect or perpendicular position*. It is of a pale yellow or buff colour, not unlike the crust of a loaf of bread, and it plays a most important part in relation to the act of swallowing; from its situation it lies above and in front of the upper part of the larynx, a cartilaginous box existing on the top of the windpipe and readily felt in the neck. As the epiglottis is extremely flexible and elastic it is depressed in the act of swallowing, covers the larynx, allows the food to pass over it, and rapidly elevates itself into its erect position; by this means neither food nor any other substance can gain entrance to the windpipe. During the act of swallowing the tongue is drawn backwards and the larynx raised forwards, the glottis immediately closes, with its regulators, the epiglottis becomes pendent or depressed, and the contents of the mouth pass over it into the pharynx, or pouch at the back of the throat, leading to the gullet or œsophagus. The epiglottis is attached by means of a pedicle to the inside of the *Pomum Adami*, or Adam's apple, felt in the neck, and is likewise attached to the base of the tongue, the os hyoides or tongue bone, and the larynx, by means of folds of mucous membrane, receiving various names from the parts they serve to connect. Only one half of the cartilage is free, and for convenience I would compare it to a little tongue situated behind the larger tongue, but pointing upwards instead of forwards.

As described, it will be understood that the epiglottis should be quite erect or vertical, which moreover allows the top of the windpipe to be freely open for the purposes of comfortable breathing. All the older anatomists were correct in describing the cartilage as vertical, and I am quite willing to admit that that is its natural and proper position.

3. Having said thus much we are now prepared to understand what is meant by *pendency of the cartilage*, and I will explain what that is, how it was discovered, and the influence it exerts

upon all classes of mankind. At the commencement of my investigations I was struck very forcibly by the circumstance of finding in a great many healthy people, that the cartilage, instead of being erect as just described, was pendent, had fallen downwards and backwards over the top of the glottis, or windpipe, like a drooping leaf. In many, again, there was a disposition to it, but such cases have not been included in my statistics. The pendency was more or less complete, and when it was so nature compensated for this by allowing the cartilage to have a dome or arched shape to allow of the entrance of air with freedom. In a good many this shape was not seen, but the cartilage lay quite flat and sloping backwards. (The various forms presented by the pendent condition were illustrated by diagrams, and a comparison made between them and the erect or vertical position, formed a contrast that could not be misunderstood.)*

4. The examination was made, as stated before, in persons of apparently good health, of both sexes and at all ages, from the infant in arms to that of extreme old age, verging upon one hundred years; children, young people, persons in the prime of life, elderly and very old persons, were all alike submitted to examination. The social relationship extended to entire families, from the grandparent to the grandchildren, and even to the great grandchildren. In this way only could I obtain valuable information regarding the congenital or hereditary character of pendency of the epiglottis. In some instances parents and their children possessed it, and it seemed an hereditary peculiarity; in others, again, it was acquired; thus three or four children would have an erect epiglottis and a fifth a pendent one; in some instances one or two children would be born with it, whilst their brothers and sisters had it not, nor did the parents possess it. In some persons again it was acquired by residence and exposure in hot climates; it is not necessarily a concomitant of the aged, and I believe, as a

* The descriptive portion of this paper has been rendered in ordinary language, devoid of technicality as much as possible, so as to be readily understood by non-professional readers.

rule, that most old people do not possess it, in Europe at least, and old age *ceteris paribus* is more within the reach of those whose epiglottis is vertical or erect, than in those again in whom it is pendent.

5. The great majority of those I examined were natives of Great Britain and Ireland; but the number included residents of other European nations, whilst a certain proportion of the African race, and an equal number of the Asiatic, chiefly Chinese, are separately given. Enough, however, was determined to permit of my forming some general conclusions in regard to all classes of people amongst the various races of mankind, in hot, temperate and cold climates, in all parts of the universe.

6. To come now to my statistics. As time and opportunity would permit, parties of individuals, varying from three or four to fifty, were examined by introducing the laryngoscope, a small mirror previously warmed, into the back of the mouth. Many of these inspections were made at my own house, or at the houses of friends; a good many at Westminster Hospital, and some at other public institutions, such as, amongst others, the Home for Asiatics at Poplar and the Seaman's Hospital Ship "Dreadnought." The results were always noted at the time, and the general health of all was good; at Westminster the persons were healthy so far as the throat was concerned. On calculating the general result, it yielded the large number of 4600 individuals, extending over a period of between six and seven years. This is exclusive of 280 natives of Asia and Africa.

7. The number of the pendencies of the epiglottis was found to be 513 in the 4600 persons, which is equivalent to eleven per cent. and a fraction. This means that eleven out of every hundred healthy persons possess a pendent epiglottis; reckoning my hearers at 200 at the late meeting of the British Association at Dundee, eleven per cent. gave twenty-two persons who were present when I read my paper whose epiglottis was pendent. Curiously enough this per centage agrees with that brought before the Association at Newcastle in 1863, and I believe it holds good in the natives of Europe and of cold countries. It is increased in hot climates, as great heat would seem to exert a more perniciously relaxing effect on the cartilage than extreme moisture or varying degrees of cold.

8. Applying the calculation of this per centage to the population of Great Britain, which, by the last census, was determined to be 28,887,519, eleven per cent. gives the number of 3,177,627 persons who have not a vertical or erect epiglottis. Or, if the population of Europe be taken, which is estimated at 272,000,000, eleven per cent. gives the number of pendencies as 24,727,273. I think I am safe in saying that other European nations would resemble our own in the comparative frequency of pendency. But if the test is applied to the natives of Asia and Africa, the results are startling.

9. I have submitted some 280 natives of India and China and various parts of Africa, with the adjacent islands, to examination, and what does the reader suppose was discovered? It was this:—every single person, of both sexes—I may say without any real exception—had the epiglottis pendent. This startled me at first; but to test the matter fairly, through the kindness of my friend Mr. F. M. Corner, surgeon to the Institution, I was permitted to examine all the inmates of the Home for Asiatics at Poplar, as late as the 25th of July last, and without any single exception, the epiglottis was found completely pendent in all. There were several fine, young, and lively negroes from the River Congo in Africa, in whom we might have expected to find the cartilage in a vertical position. But no; it was completely pendent. Finding, therefore, that in the 280 natives of hot climates, such as exist in Asia and Africa, the epiglottis was pendent in all, or nearly all, we are driven to the conclusion that it must be a common peculiarity to the races of those great continents. There is this to be said, however, regarding these pendencies: the examination was made exclusively in this country, and it is just possible that the cartilage may have become pendent in a tolerable number on their change from a hot climate to our more temperate one. Nevertheless, I am not disposed to attach too much importance to this, because I have been satisfied on several occasions of the fact, that Europeans acquire pendency by a lengthened stay in hot climates. The estimated population of Asia is 750,000,000, and of Africa, 200,000,000; whilst Oceana is set down at 2,000,000. All these together amount to 1,150,000,000

of persons, of whom it would be rash in the highest degree to say more than that a large proportion, much greater, indeed, than amongst Europeans, possess pendency of the cartilage. Can it be wondered at that we should find a number of circumstances result from a condition which impedes free breathing and renders a proneness to disease in some shape?

10. The influence of pendency of the epiglottis upon all classes of mankind, but especially on Europeans, may be described as follows:—

It will be remembered that the great aperture or entrance-door of the windpipe is closed three-fourths—I might say seven-eights; therefore, the air for the purposes of breathing has to enter by means of a narrow opening, which, however, after being respired, passes out again with greater facility than it entered. The first effect of this condition is a modification or alteration of the natural voice; the voice, as a rule, has a tendency towards a bass tone in adult males, for the pendent epiglottis acts the part of the lid of an organ pipe. The singing voice is materially altered; and in the female sex the higher notes cannot be produced at all in some persons, whilst in others the vocal power and compass are weakened, and pendency is inimical to anything like prolonged singing. I have never known a single instance of one of the great female singers of the day—and I have had several of them under my care from time to time—to possess a pendent epiglottis; there may have been a disposition to a little pendency from relaxation, the result of cold or an over exertion of the singing voice, but that condition was always temporary. In singing the higher notes, as witnessed in the contralto and soprano voices, the opening into the larynx or top of the windpipe must be perfectly free and the epiglottis quite erect, so that the direction of the sound shall be towards the roof of the mouth, entirely in front of the soft palate. In pendency of the epiglottis, on the other hand, the voice strikes the back of the throat *behind*, instead of in front, of the soft palate. In some persons, the pendency is so complete, that a mere semicircular chink exists for the air to enter, and the inconvenience in singing is greater. Yet that very circumstance gives to a few of the male sex a

voice for declamatory reading which is remarkably powerful and beautiful; nevertheless, such persons are liable at all times to colds, from the necessarily impaired power of breathing. Young girls with this condition can never expect to become singers of any importance unless it is remedied; and in them, and in boys too, but especially in girls, the voice, in speaking, is not clear and silvery as it ought to be. In young people the tonsils are often enlarged when the epiglottis is pendent, for the natural circulation is not free and easy through the blood vessels of the throat.

11. Although the general health is apparently good, in a certain number of persons there is a disposition to sluggishness of body and general languor, the result of impeded respiration. In certain states of the atmosphere this renders them liable to attacks of disease to which they may be constitutionally predisposed.

12. During the prevalence of the ordinary exanthemata, such as scarlet fever, measles, whooping cough, and diphtheria, or of epidemics of throat and chest affections, persons with a pendent epiglottis, particularly children and young people, are more liable to become affected than others whose *windpipe door*, as I may call it, is wide open, and this for the reasons already given.

13. I am not going too far in saying, that in grown-up persons with a pendent epiglottis there is a greater risk towards the contraction of prevailing epidemic diseases than in those otherwise circumstanced; and perhaps it may help to explain why, sometimes, comparatively healthy persons are struck down, while others, seemingly more delicate, escape. For it must be remembered, that when the breathing is not free, the general health indirectly suffers, through deficient arterialisation of the blood, and its effects upon the entire system. A great many grown up persons breathe with discomfort in their beds with a pendent epiglottis; and not a few become asthmatic and subject to chronic bronchitis as they advance in life. I am satisfied that few, very few, or perhaps none, in this country, at least, ever reach extreme old age with a pendent epiglottis.

14. Heretofore no person, with the exception of myself, has dwelt upon the importance of such a peculiarity as that I have

described, or upon its general effects; and I would again remind the reader that there are 3,177,627 persons the subject of it in Great Britain alone. Its great frequency, especially in hot climates, might lead many persons to say, it is a natural condition; indeed, I thought so myself at first, but now feel satisfied that it is not. In conclusion, the reader would naturally ask me, what are the means proposed to remedy pendency of the epiglottis? They are these:—

15. Let him request his medical attendant to examine him with the laryngeal mirror, and if he finds the epiglottis drooping, or in a pendent position, more or less complete, it will be prudent for the reader to note it, have it attended to, and in a large majority of persons, the young especially, it can be rectified and elevated.

On the whole, however, I think it has been shown that the influence of pendency of the epiglottis upon mankind generally is prejudicial and pernicious, and therefore well worthy the attention of philanthropists and anthropologists.

I have elsewhere termed the process of examination, *Epiglottisation*, which possesses a meaning somewhat analogous to *vaccination*.

VI.—*Note on the Skulls found in the Round Barrows of the South of England.* By C. Carter Blake, Esq., F.G.S., Hon. F.A.S.L., Lecturer on Comparative Anatomy and Zoology at Westminster Hospital.

During the late visit of the President of the Anthropological Society to Dorsetshire, he was enabled to obtain from Mr. Shipp, of Blandford, twelve skulls and fragments of skulls from the round barrows of the district near Blandford. I have been led to give the following slight note on these skulls, as they exhibit some remarkable characters, and their examination may confirm or invalidate the theories which have recently been promulgated respecting the typical character afforded by the skulls found in the round barrows of the South of England.

Dr. Thurnam, in his paper on the two principal forms of English and Gaulish skulls (*Mem. Anthrop. Soc. Lond.*, vol. i), gives a table which contains the measurements of twenty-five skulls from the English round barrows. The longest of these exhibits a cephalic index of ·74, the shortest a measurement of ·87: the average cephalic index being ·81. He has been led to conclude, therefore, that the typical character of the skulls found in round barrows is that which presents the brachycephalous type. The following are the words in which Dr. Thurnam states his theory:—

"The form of skull, from the bowl-shaped, bell-shaped, and other circular barrows of pre-Roman Britain, scarcely requires extensive illustration; being on all hands admitted to be brachycephalous."—(P. 149.)

"The skulls from the circular barrows of England of the pre-Roman period are mostly of brachycephalic or sub-brachycephalic type; this short and broad, or round, cranial form being found in tumuli evidently of the same epoch, though some of them contain implements and weapons of both bronze and stone, others of stone only."—(P. 120.)

"Whilst the dolichocephalic skulls from the long barrows group themselves around the number 70, as regards the

proportion of the breadth to the length taken as 100; the brachycephalic ones from the round barrows are mostly represented by the number 80 and upwards."—(P. 150.)

"To sum up the conclusions as to the forms of skull from the tumuli of the pre-Roman period in this country, a sort of axiom has, I think, now been established to this effect:—Long barrows, long skulls; round barrows, round or short skulls; dolichotaphic barrows, dolichocephalic crania; brachytaphic barrows, brachycephalic crania."—(P. 158.)

I shall now give the description of the remains in the words of Mr. W. Shipp.

SKULLS FOUND IN TUMULI IN THE NEIGHBOURHOOD OF BLANDFORD.

No. 1.—"From a barrow in the parish of Whitechurch. The skeleton, with that of a child, was lying about two feet below the vegetable covering, and evidently of a later date than the construction of the barrow itself."

No. 2.—"From a barrow at Winterborne, Kingston. At its feet was a coarse British urn filled with burnt bones. On the floor, on a cist, was another skeleton (No. 3), with a large deposit of burnt bones by its right side."

No. 4 and 5.—"From a barrow on Kingston Down, in which were seven skeletons lying side by side; but no urn, or any trace of cremation."

No. 6 and 7.—"From a barrow in the vicinity of a British camp at Burbury, containing two rude urns and several deposits of burnt bones."

No. 8.—"This skull was found, with upwards of one hundred others, on the east side of a British camp at Spetisbury—cut through for the Blandford and Wimborne Railway. With these were several iron swords, bronze fibulæ, rings, bone combs, and other articles of Roman manufacture."

No. 9.—"From a barrow on Roke Down, in which were three skeletons, four urns, and several deposits of burnt bones."

No. 10 and 11.—"From a barrow on Bloxworth Down, in which were six skeletons, placed in a sitting posture on the

floor, with three urns containing several beads, bone needles, etc., etc."*

No. 12.—"From a barrow on Abbey Croft Down, in a cist, on the floor, with a rude British urn at its head."

I now proceed to give the measurements of these skulls:—

MEASUREMENTS OF SKULLS FROM BLANDFORD ROUND BARROWS, ARRANGED IN ORDER OF RELATIVE BREADTH.

	No.	Localities.	Length.	Breadth.	Cephalic Index.
Mecisto-cephali.	8	Spitsbury British Camp, with Roman remains	204	136	·66
	4	Kingston Down Barrow	194	131	·67
	5	,, ,, ,, ...	194	133	·68
	9	Rokedown Barrow	192	132	·68
	7	Burbury ,, ...	196	136	·69
	6	,, ,, ...	192	135	·70
Meco-cephali.	3	Winterborne ,, ...	182	132	·72
Subbrachy-cephali.	2	,, ,, ...	178	142	·79
Eury-cephali.	1	Whitchurch ,, secondary interment	174	141	·81
	10	Bloxworth Down Barrow } fractured			
	11	,, ,, ,, }			
	12	Abbey Croft Down ,, }			
		Average Cephalic Index	...	...	·73

When these skulls are carefully measured, it appears that the ratio of breadth is much smaller than in the average skulls measured by Dr. Thurnam. Where his lowest breadth is ·74, the lowest breadth of the Blandford skull is ·66. Where his highest breadth is ·87, the highest breadth of the Blandford skulls is ·81; the average being in each case respectively ·81 and ·73.

If the Blandford skulls (nine in number) are added to Dr. Thurnam's table of twenty-five skulls, the average of the whole thirty-four will be found to be ·77. It will be borne in mind that the average he gives for his skulls from long barrows is ·71.

* There is some obvious mistake or transposition of numbers here, inasmuch as the frontal bone, marked 12, has undoubtedly appertained to the same individual as the posterior part of cranium marked 11.

The distinction between an average of ·81 and ·77 must strike all observers: and many may consider that this deduction of 4 per cent. may invalidate much of the general conclusions arrived at by Dr. Thurnam.

According to the theoretical assumption conveyed in Dr. Thurnam's statistics, the average cephalic index of nine skulls from the round barrows ought to have been about ·80. The precise proportion given is ·81. But the fact negatives this *à priori* conception, as we have an average of ·73. Furthermore, six out of the nine skulls appertain to that group of skulls which present a cephalic index of below ·71, and which Professor Huxley has termed *mecistocephalic*, a term highly convenient, and which I am very glad to adopt. This fact is very surprising, as it shows that even in the district of the *Dobuni*, where long-headed individuals have been discovered and described in Davis and Thurnam's *Crania Britannica*, we have an extremely long-headed population whose remains are found in the short barrows. Furthermore, while the longest skull given by Dr. Thurnam from his long barrows (West Kennet, pl. 50, *Cran. Brit.*) has a cephalic index of ·67, this index is equalled by the skull from the Kingston Down short barrow, also affording an index of ·67.

The skull No. 8 from the British camp at Spitsbury, associated with iron remains and articles of Roman manufacture, although not found in a barrow, must be included in the present comparison. If its measurements are carefully compared with those of the two skulls from Kingston Down, no person will be able to doubt that they appertained to the same race.

I have also included the skull 1 in the present comparison. It is probably of later date than the barrow itself: being brachycephalic, or, more strictly speaking, "eurycephalic" (Huxley). A strict logical necessity may, however, lead to the exclusion of this skull from the average.

Let us, therefore, exclude the skulls Nos. 1 and 8 from the comparison. The following will be the results, and they are very startling:—

That the seven skulls from the Blandford round barrows afford a lower cephalic index than the twenty-five skulls mea-

sured by Dr. Thurnam from his dolichocephalic barrows, the figures being ·70 and ·71 respectively.

If I were inclined to base any conclusion on these figures, we might reverse Dr. Thurnam's "axiom," and say, "long barrows, long skulls; round barrows, long skulls too, and *sometimes longer.*"

The researches of Dr. Beddoe on the head-forms of the West of England have led him to conclude that the skulls of the people of the West of England are decidedly dolichocephalic. His lowest index given was ·76, and this was derived from the observations derived from the inspection of forty natives of north-western Wiltshire. But the natives of Dorsetshire at the time of the erection of the round barrows, appear to have been far more dolichocephalic. The type of Irish skull is also stated to be long. Dr. Beddoe gives it in Munster as ·76. Dr. Barnard Davis gives it in Kerry as ·77. Professor Huxley states that "the ancient Irish skull was predominantly dolichocephalic, more so than even the ancient Scotch skull;" giving as examples, the Blackwater skull (c. i. ·79) and the Borris skull (c. i, ·737). Dr. Beddoe states that "the ancient Irish skulls, as well as the mediæval and modern ones, are long; the four in the catalogue in the *Crania Britannica* average ·762, and the two in the Museum at Kilkenny the same modulus to a fraction." But the skulls from Blandford are, indeed, *ipsis Hiberniis Hibernior*, as they afford a less cranial index than any of the above cited crania. However, it cannot be denied that the resemblance between the skulls from the long barrows, as well as those from the round barrows now before us, and the "River-bed skulls" of Professor Huxley, is very great. He was led to conclude:—

"As the evidence stands at present, I am fully disposed to identify the ancient population of Ireland with the long barrow and 'river-bed' elements of the population of England, and with the long-headed, or 'cumbecephalic,' inhabitants of Scotland; and to believe that the round barrow, or 'Belgic,' element of the Britannic people never colonised Ireland in sufficient numbers to make its presence ethnically felt."

The description of these skulls may follow at another time.

I have only now to deal with their moduli. I may notice that in the general contour they agree closely with the long-headed type of skull termed "Apostle skull," by Professor Carl Vogt. One of these, found at Biel, is in the Museum at Berne. Its cephalic index is ·70. They also agree with the Höhberg-types of Messrs. Rutimeyer and His, especially with such a skull as that figured c. II from Höhberg, whose index is ·69. The average breadth of skulls in the Höhberg type my readers will recollect to be ·707.

The conclusions I would desire at present to draw are the following:—

1. That the state of materials at our disposal precludes any generalisation as to the prevalence of a brachycephalic type of skull in the round barrows of the South of England.

2. That a much larger series of skulls from the round, as well as from the long barrows, must be measured before we can arrive at any conclusion as to the cranial modulus.

VII.—*On the Gypsies of Bengal.* By BÁBU RÁJENDRALA'LA MITRA, Corresponding Member of the Anthropological Society of London, Hon. Member of the Royal Asiatic Society of Great Britain and Ireland, Corresponding Member of the German and the American Oriental Societies, etc.

THE belief in Europe is general that the gypsies are of Asiatic origin. Grellmann, in his *Dissertation on the Gypsies of Europe,* supposed India to be the birthplace of that wandering race, and Hoyland's *Historical Survey of the Gypsies* fully supports that opinion. Borrow, in his *Gypsies in Spain,* adopts the opinion of Grellmann, and he has been most ably seconded by Colonel Hariot in his *Observations on the Oriental Origin of the Romnichal Tribe.* Owing, however, to their vagrancy and extreme reluctance to mix with the settled inhabitants of any country, the history of the gypsies has been most imperfectly studied; and there is no work that we know of in which their origin has been indisputably traced to any particular locality, or any satisfactory account of the when and how they dispersed from the scene of their original habitation. An idea was once prevalent that the atrocities of Timur's invasion of India drove out large bodies of the people over different countries, and that they constituted the patriarchs of the gypsy race. But Arab Shah, in his biography of Timur, has shown that gypsies lived in Samarcand long before Timur's invasion, and that they were at one time massacred to the extent of several thousands to relieve that tyrant of internecine disturbances, and several centuries before that Ferdusi sang of a band of gypsies who had come to Persia at the request of Behram Gur to entertain his people with the music of the lute. The men were called "luri," and the gypsies in that country are to this day known by that name. Foroliviensis observes that, on the 4th August, 1422, two hundred of the Cingari came to his native town, on their way to Rome, and some of them said

that they were from India: "et ut audire alique dicebant, quod erant in India." Munster corroborates this account from the information he gathered of one of the Cingari in A.D. 1524, "when, also, an impression existed among them of their having come from that country." These evidences do not, however, go far enough; and the proofs regarding the original dispersion of the gypsies from India, and their existence in this country in the present day, must depend exclusively upon the peculiarities of their language, customs, habits, and physical characters,—data which, owing to climatic and other influences, must always be to some extent inconclusive.

The name by which the gypsies proclaim themselves is *Rominichal*, or, "wandering man", but the word is used by themselves only, and is unknown to the people among whom they live. The word "gypsy" is a corruption of Egyptian, and is not known beyond the local limits of England. In Scotland they are called "tinklers". In France, they are known as "Bohemians", from the circumstance of their having come there on their expulsion from Bohemia, and consequently it is not to be met with elsewhere. The Spanish name *gitana*, which was used to indicate the crafty character of the people, and the Italian, *Wallachian*, are also local. The Bohemian name *zingaro*, and its German congener *zigeuner*, with its Portuguese corruption, *cigano*, appear among the Turks as *zingari*, *zigani*, *zingani*, and *chinganeh*. From Turkey the word has been traced to Persia, and thence to the mouth of the Indus, in Beloochistan, where Pottinger noticed a tribe named *Tchingani*, who bear a strong resemblance to the gypsies in many of their peculiar customs. It is said that when Sultan Selim conquered Egypt, the inhabitants rose against him under the leadership of one Zinganeus; but being defeated and banished the kingdom, they dispersed, in numerous small parties, over different countries, where they became known by the name of their leader. This opinion, however, involves an anachronism of more than a hundred years; for while Sultan Selim's conquest is dated 1517, there is undoubted evidence to show that the Zingaris appeared in Europe in the beginning of the fifteenth century. Sir Thomas Browne fixed

the date of their appearance in Germany at A.D. 1400, but Munster and Spilman changed it to 1417. In Switzerland and Italy they were noticed in 1422, and in France in 1427.

In India, the word *Zingaro* does nowhere occur; but it is curious to observe that, in Sweden, the gypsies were once known by the name of *tottors*, and in the duchy of Holstein they are to this day called either *zikhoiners* or *tottors*, while in different parts of Denmark their usual name is *totters*. Now, these Tarters, Tatters, or Taters (Anglicè, *Tartars*), or some of them were, before the time of Zinghis Khan, known by the name of "bede", a word which, in India, is with slight dialectic variations, applied to a race of vagrants whose habits and customs, as far as known, point to their having proceeded from the same stock to which the gypsies owe their origin. Bishop Heber noticed these people on the banks of the Ganges and in Ceylon, and believed them to have a close resemblance to the *zingaroes* of Persia and Europe. Abbé Dubois observed them in Southern India, where they are known under the names of *weddahs, nuts, ruraver, sámbádi, ruruneru,* and *sikáter*. The Bunjaras of Central India have been supposed by some to be a race of gypsies. So are the Konjis and Dombarus; and Mr. Stevenson describes a people in Dekhan who bear a strong likeness to the vagrants of Europe. He says, "the shadgárshids (for that is the name by which those people are known) are a tribe of jugglers and fortune-tellers who wander about the Dekhan, and probably other parts of the country, where, however, they are not known by this name, but generally, we believe, by that of "gorode" (juggler), which is the denomination of the caste in the *Vijñáneswara Sástra*. The Karnátaka term of "shudgárshid" is derived from *shudgár* (a burning or burial ground), and *shid* (proficient, ready), it being their habit to prowl about these places to collect certain pieces of human bone with which they are supposed to work charms and incantations. The tribe is looked upon with much awe and detestation; and the fear of exciting the wrath of any of its members, generally secures a ready compliance with their demands for charity. On this, however, they do not place their only reliance; they are no-

torious for kidnapping children, and also for an abominable traffic, consisting in the sale of sinews extracted from the breasts, the wrists, and the ankles of females. These are supposed to be preservative charms from all evils; but in order that they may possess this virtue to the full extent, they must be taken from the person of a woman who has been very lately delivered. The caste of Shudgárshid is said to have sprung from the union of a woman of the Patráwat (stone-cutter) tribe and of a Kula or Kaber (boatman). Kabir Rishi, the author or compiler of one of the *Velas*, taught the art of magic to some of the first of this race, who have now lost the greater part of their original skill. The deity, which they conceive chiefly entitled to their worship, is the goddess Chowdhi (Chandi?), whose principal shrine is in Malabar, where, we understand, the caste is most numerous. North of the Krishna they worship Rámástick, a goddess whose chief pagoda is in Kundáhár." The fondness for extracting sinews from dead bodies is evidently a local peculiarity, and has not been found in any other branch of the gypsy race. Mr. Stevenson does not notice the Weddahs; but his description leaves no doubt that his Shidgárshids are a detachment of that tribe.

The Weddahs are represented in Ceylon by a race called Veddahs. Bishop Heber, as has been before said, called them a tribe of gypsies; but in the detailed account of Sir Emerson Tennent, there is nothing to warrant this belief. He says they are the remnants of the aborigines, but characterised by nothing of vagrancy, fortune-telling, and other peculiarities of the gypsies.

In Bengal, the counterpart of the Weddahs are met in a tribe of men called Bediyás. Their physical characters are not much different from the people among whom they live, and yet there are certain peculiarities in their make which show them to be distinct from the Bengalies. Whether it be owing to the wandering life they lead, or the ethnic peculiarity of their race, we do not know; but the fact is certain that the Bediyás show no tendency to obesity, and are noted for a light, elastic, wiry make, very uncommon in the people of this country. In agility and hardihood they stand unrivalled. The men are of

a brownish colour, like the bulk of Bengalies, but never black. The women are of a lighter complexion, and generally well formed,—some of them have considerable claims to beauty; and for a race so rude and primitive in their habits as the Bediyás are, there is a sharpness in the features of their women, which we see in no other aboriginal race in India. Like the gypsies of Europe, they are noted for the symmetry of their limbs; but their offensive habits, dirty clothing, and filthy professions, give them a repulsive appearance, which is heightened by the reputation they have of kidnapping children, and frequenting burial grounds and places of cremation. Their eyes and hair are always black, but their stature varies very much in different individuals. But as there are now many men in Bengal who have been driven by poverty to take to the professions of the Bediyás, without being of that caste, it is unsafe to draw any deduction from limited experience; a great number of men who profess to be Bediyás, but who turn out, on cross examination, to be either outcasts, or descendants of outcasts, who, for want of better, have adopted the profession of the Bediyás. Some of them called themselves Máls, and live by snake-catching and sale of herbs. These, as well as other pseudo-Bediyás, have none of the physical peculiarities of their namesake, and are generally of a black complexion. Though popularly known as Bediyás, they keep distinct, and are never allowed to mix and intermarry with the true Bediyá. In this they differ from the European gypsies who, according to Sir Walter Scott, have mixed largely with vagrants of European descent.

The true Bediyá does not often build a permanent house, and seldom takes to agriculture. Like the gypsy, he leads a roaming life, and is content with whatever accommodation he can get. When travelling in bodies, the Bediyás carry with them a few beasts of burthen, generally country tatoos or bullocks, frequently the former, but never or seldom donkeys. The place of their encampment is the outskirts of a village, and there they put up, with the mats and sticks, a few miserable little wigwams, in which men, women, and children huddle together, with little attention to ease or con-

venience. In some parts of the Burdwan and Baraset districts in Bengal, the Bediyás have permanent huts, like those of the native peasantry. They are frequently forsaken, and are put up only to evade the persecution of police officers. In Baraset, some few take land, ostensibly for agricultural purposes, but really to represent to police authorities that they are fixed inhabitants of a place, usefully employed, and not liable to be taken up as vagrants. The land in question is tilled by hired labour, and bears no proportion to the number of people for whose benefit it is sown. It is generally situated at a great distance from the fields of the Bengali ryot.

The dress of the Bediyás assimilates generally with that of the people among whom they live. The Nuts have party-coloured cloths hanging from different parts of their body, and jugglers sometimes put on some outlandish garment or other; but the great bulk dress very much in the same way as the natives of the country. This adaptation of the dress to the customs of a country, is the characteristic of the gypsy everywhere.

One marked peculiarity of the European gypsy is his cooking-pot, which is invariably made of iron, and hung from three posts, with a fire underneath. The Bediyá has no such utensil; his pipkin is the common kidgree-pot of the country, used over three bricks or clods of earth, and sometimes over a native hearth, or *chulá*. The cooking, however, is made in common, and men, women, and children all eat together promiscuously, except when placed among Bengalis, when the women eat separately.

The gypsies are not noted for the choice of their fare; the the Bediyás are even less so. More omnivorous than crows, they eat whatever they can get, and nothing comes amiss to them, whether it be a rotten jackal or a piece of veal, beef, or mutton. Familiar with the use of bow and arrows, and great adepts in laying snares and traps, they are seldom without large supplies of game, and the flesh of wild animals of all kinds. A variety of birds they keep dried for medicinal purposes; and mongooses, squirrels, and flying foxes, they seek with avidity, as articles of luxury. Spirituous liquors and in-

toxicating drugs are indulged in to a large extent; and chiefs of clans assume the title of *bhangy*, or "drinkers of bhang" (Indian hemp), *par excellence*, as a mark of honour.

In Spain, and also in Hungary and Transylvania, some gypsies follow trades, and become innkeepers, farriers, and dealers in horses, smiths, nail-makers, tinkers, and menders of old pots and kettles, while some have become soldiers and sailors; but those are not their national professions. The great bulk of the gypsies in Europe are jugglers, tumblers, thieves, hunters, weavers of wicker baskets, makers of wooden platters and spoons, and vagabonds of all work; the women being employed in early life in rope-dancing and legerdemain, and subsequently in fortune-telling and chiromancy, in interpreting dreams, selling herbs and charms, and pilfering whatever comes in the way. The Bediyá in Bengal is ignorant of none of these professions. In lying, thieving, and knavery he is not a whit inferior to his brother of Europe, and he practises everything that enables him to pass an easy idle life, without submitting to any law of civilised government, or the amenities of social life. Hence the Bengal proverb, *Bede rájárá ráyot nahi sádhuro khátak nahi*, "The Bediyá is neither the subject of a king, nor the debtor of a capitalist."

When in the neighbourhood of towns or villages, the Bediyá earns his livelihood by thieving, exposing dancing-monkeys, bears, and serpents, retailing herbs, weaving baskets, and selling birds, squirrels, sheep, goats, and mungooses. When away from the habitation of civilised man, he is a hunter of jackals and foxes, a bird-catcher, a collector of herbs and simples. The Luri of Persia and the Multani of Cabul keep bears and monkeys, and all three are attended by wild, half-savage dogs, as are the Bunjáras of central India and the gypsies of Europe.

The female Bediyá or Bediyáni is the very counterpart of her European sister. She roams about in towns and villages, with a small bundle on her head, which contains an unfailing charm for every complaint of the body or the mind, for which she may be consulted. Is a child ill of infantile convulsions? the cause is the devil, and none can exorcise better than a

Bédiyáni. If a village-girl has found her lover or husband untrue, none can give a more potent philter to restore lost affection than the woman with her bundle of simples. To calculate the return of absent lovers, or ascertain the sex of incipient pledges of love, she goes a-head of the professed astrologer. Palmistry is her special vocation; and cupping with buffalo-horns, and administering moxas and drugs for spleen and rheumatism, take a great portion of her time. She has a peculiar charm for extracting maggots from the root of carious teeth. When a boy, the writer of this note was subject to irritation and swelling of the gums from carious teeth, and for it the affection of a fond mother, and the general ignorance of the healing art at that time, suggested no better remedy than the mantra of the village Bediyáni. On three different occasions we had to submit to her, and thrice she charmed out small communities of little maggots by dint of repeating a variety of most indecent verses. She used to apply a tube of straw to the root of the carious tooth, and every now and then bring out a maggot in its barrel. Once spun cotton was used instead of straw, but with no diminution of success. The operation was, no doubt, a deception, but the relief felt was unmistakable and permanent.

The feeling of admiration for little black moles on a fair face is an oriental peculiarity. In India, it is as strong as it was in Hafiz, who offered to give away both Samarcand and Bokhara for a single mole on the face of his beloved. The usual mode of producing it is by tattooing,—an art unknown to all in Bengal, except the Bediyánís. For this purpose they roam about in villages, during the cold weather, proclaiming their profession and inviting customers. Young girls are their principal patrons, and they generally get themselves tattooed between the eyebrows or below the under lip. Sometimes the breasts and the forearms are also subjected to the operation, which consists in introducing under the epidermis, with the point of a needle, the juice of a plant, which soon dries into an indelible black spot. An imitation is sometimes produced by unprofessional village boys by the use of writing ink; but the marks in such cases are badly formed, and soon change to

a pale blue of no beauty. The process is called *ulki* or *godáni* in Bengal. At home, the occupation of the Bediyáni is weaving mats of palm-leaves, cooking being the exclusive duty of her lord.

In Europe and Persia, the gypsies are noted for some talent in music, but we are aware of no such trait in the Bediyá of this country; and although the Spanish zincali is an accomplished *danseuse*, her Bengali sister has no other claims in that respect than what can be assumed by her performances on the tight and the slack rope. Capt. Richardson's notice of the Nuts of Bengal contradicts our experience in this matter. According to it the Nuts, who are only a division of the Bediyás, are great proficients both in music and dancing. The Bunjárás are fond of music. Ferdusi makes that accomplishment the cause of their exodus to Persia; and Jaye Sing, of Canouge, sings of the Bardins' (female gypsies) perfection in the arts of singing and dancing.

Female gypsies are obliged, by the nature of their profession, constantly to expose their persons to public gaze in the prime of their youth, and to habituate themselves to a great deal of indecency and intercourse with men; still they are noted for their fidelity to their lords. The Bediyá woman is, perhaps, even more circumspect in this respect than her European representative. She is expected to return home, after her day's peregrinations, before the jackal's cry is heard in the evening, and in default is subjected to severe punishment. It is said that a *faux pas* among her own clansmen is not held reprehensible, but we have no means of giving any authoritative opinion on the subject; certain it is that no Bediyáni has ever been known to be at fault with anyone not of her own caste.

Marked moral traits are not to be expected in a race of professed thieves; and yet the Bediyás are fond husbands, kind parents, affectionate children, and unswerving friends. Attachment to their nationality is extreme, and no Bediyá has ever been known to denounce his race. Whenever a Bediyá is apprehended by the police, his clansmen do their best to release him, and if condemned to imprisonment or death, they invariably support his family.

Of religious ties the gypsy has few, and the Bediyá is noted for want of fixed opinions on that subject. The former professes to be a Christian whenever it suits his convenience; and the latter is by turns a Hindu or a Mussulman, according as he is in the midst of a Hindu or a Mohammedan population. Some are deists; some are *Kalier panthis*, or Sikhs; and others assume various disguises, as Fakeers, Jogees, Durvishes, Santons, etc. Hence, the Bediyá has earned the title of *Panchpíri* or "followers of many (lit. *fine*) *pirs*, or saints." He does not, however, subject himself to any of the rites of the religion he professes. His dead are generally buried; and his marriage contract is solemnised over country arrack, without the intervention of priests, the only essential being the consent of the heads of his clan. Marriage is restricted to his own caste; but kidnapped children, brought up in his camp, are not prohibited. The Bediyá is even more sparing of ceremony. In reply to the exhortation of the bride's relatives to treat her kindly, he simply declares "this woman is my wedded wife," marking her head at the same time with red lead. The bride responds, by saying, "this man is my husband," and returns the mark on his forehead. The red lead is, in Europe, replaced by a ring, both evidently proceeding from local customs unconnected with gypsy peculiarity. In central India, the Benjares are strictly forbidden to intermarry in their own clans; but the prohibition does not extend to the Bediyás of Bengal, among whom incestuous marriages are suspected to be common.

It is said that all Bediyás, whether professing Hinduism or Mohammedanism, worship the goddess Kálí. This is, no doubt, a peculiarity borrowed from the Thugs, by whom that goddess is supposed to be the patroness of rogues and thieves.

The Bediyás never appear before a court as complainants, nor do the gypsies. They are both under the control of chiefs who, in Europe, have the title of "kings", and in India, "Sirdars". These chiefs are invested with supreme power, and with the aid of councils, or "panchayets", they administer justice, and manage the affairs of the different clans. Their decrees are final; and no member of their community ever

dreams of appealing to any higher authority. Even in cases of excommunication, the regard to the interest of the community is sufficiently strong to prevent any appeal to the law courts of the country. The punishments inflicted by the panchâyets are confined to fines, and stripes with a shoe: but in extreme cases, expulsion from caste is had recourse to. The proceeds of the fines are devoted to the entertainment of the community with spirituous drinks, a small percentage being paid to the chief for the support of his rank and consequence. His rank is generally hereditary; and he is invested with authority over his clansmen wherever they may be located. The exercise of this authority is seldom found to be impracticable, inasmuch as the Bediyá, though habitually a vagrant, still has considerable attachment for the district of his birth, and returns there often in course of his ramblings. Subordinate to the chief, there are a number of leaders to whom he delegates his authority, for the government of his subjects at a distance from his head-quarters. The chiefs of the Bunjaras attained to great distinction during the reign of Aurungzebe and his successors, who honoured them with firmans and flags in token of their services as carriers of commissariat supply. Bhikhá was the first who distinguished himself in this way; and one of his descendants, Sarun Bhungy, established rules for the government of the race, which are held in the highest veneration to this day. We know of no such code among the Bediyás, nor have they ever made themselves in any way useful to civilised man.

As a nation of thieves, the Bediyás are everywhere persecuted, and obliged to resort to the most tortuous means to preserve themselves from utter extermination. In all cases of dacoity, they are the first to be seized, and their name alone suffices to ensure their conviction in most instances. Occasionally, an active magistrate, or darogah, causes their expulsion from one district to another, and frequently they are put to great annoyances and trouble. Seven years ago, a magistrate of Baraset proposed to place guards over a whole community of Bediyás, with a view not to allow them to stir out of their homes at night, and to keep them under *surveillance* during

the day. A few years before that, an officer in Jessore expelled a large body of Bediyás from that district. A police-officer of some experience once assured us that—out of a community, it is supposed, of about 5,000—at least 500 Bediyás are annually convicted of theft, house-breaking, and dacoity, in three or four districts of Bengal. This would imply either extreme persecution, or an inordinate devotion to thieving,—perhaps both. In Europe, the gypsies do not at all differ from the Bediyás in this respect. Since their entrance into that quarter of the globe, they have been marked out for general persecution everywhere. From Bohemia they were expelled soon after their arrival in that country, and from France in 1560. In Spain, they proved a perfect nuisance by their constant pilferings, and were ordered to leave the country in 1591. In England, they fared no better. Act 22 Hen. VIII, c. x, describes them as "an outlandish people, using no craft or feat of merchandise, and living by thefts or robberies." They are accordingly directed to leave the country, under pain of imprisonment and forfeiture of property; and in trials of felony declared not entitled to a jury *de medietate linguæ*. Subsequently, in the reigns of Mary and Elizabeth, the rigors of these restrictions were greatly increased; and residence for a month in England by a gypsy, or others in the guise of gypsies, was declared felony, without benefit of clergy. These laws were carried out with great severity, and yet they seem to have produced little effect; and the gypsies lived on, and to this day live as do the Bediyás, in the practice of their nefarious callings, without any perceptible diminution of their number.

The language of the gypsy has been proved to be the Hindustani, with a mixture of vocables borrowed from the people among whom they happen to live, and partly from the German and the Russian. In Bengal, the foreign elements are replaced by Bengali and Sanskrit, but the language is not used in the way the gypsies use it. Hindustani would ill serve the purposes of a secret means of intercommunication in the midst of an Indian population. The Bediyás, therefore, have transposed the syllables of their words, and prepared a kind of backslang, which, without much changing the words, renders them per-

fectly unintelligible to the unitiated. In England, the backslang of the costermongers offers an apt parallel to this. The main principle of their language, as that of the Bediyá, is to spell their words backwards, or rather, pronounce them rudely backwards, with occasional alterations, additions, and subtractions of particles and syllables for the sake of euphony, and perhaps, also, with a view to add to their mystery. In this way the costermongers make *dlog* for "gold"; *doog* for "good"; *edgabac* for "cabbage", *earth sith no um* for "three months", etc.; and the Bediyás have their *ga* for *ag*, "fire"; *ragha* for *ghar*, "house"; *onk* for *kon* "who"; *bálam* for *lambá*, "long"; *noso* for *sona*, "gold"; *lash tu* for *tálâsh*, "search", etc. Besides these, they have a great number of words formed by modifying vernacular terms without reference to any fixed rules. These they make use of sometimes alone, and sometimes mixed with the backslang, in their intercourse with their own people; but they are particularly careful not to let out their knowledge to strangers.

The grammatical construction of the Bediyá language is the same as that of the Bengali. In a like manner, the gypsy language in Spain is governed by the rules of the Spanish grammar, and in England by those of the English. For intercourse with their neighbours, the Bediyás study the vernaculars of the country, and sometimes acquire considerable talent in reading and writing.

BEDIYA VOCABULARY.

English.	Bediyá.	Hindustani, Bengali, etc.
Twilight	Bibit	Shám, H.
Tobacco	Máktá	Tázmák, B.
Shoe	Táju	Jutá, B., H.
Fish	Si-m-ti	Matsya, B., Machchhi, H.
Cloth	Chip rá	Kaprá, H., Kápa ra, B.
House of brick	Jhotá	Kotághar, B.
Fire	Kag or Ga	Ag, H., Agun, B.
Come	A'	Ao, H., Aiso, B.
Sit	Bá	Baitho, H., Baisa, B.
Go	Ja'	Jao, H., B.
Gone	Gá	Geya, H., Giyáche, B.
Taken	Li	Liá, H., Liáchhe, B.
Done	Ki	Kiá, H., Kariáchhe, B.
Relation	Bhá-o	Bhái, B., Bhaiá, H., (for brother)
Police	Kijjak ko kárá	
Sleep	Sui	Sona, H., Supta, S.

English.	Bediyá.	Hindustani, Bengali, etc.
Water	Páni	Pani, H.
Goat	Báo, kekád	Chhágal, B., Bakrá, H.
Eight anna piece	Kuduli	Aduli, B.
Father	Baro	Bap, B.
Light	A lo hu ti re	A-lo, B.
Cloud	Me á-ghá	Megha, B.
Village	Datto	
Earthen tobacco-cup	Dhulki	Kaliká, B., Kalki, H.
Darkness	Pandu	Andhera, H., Andha kára, B.
Moonlight	Dhula	Dhula, B., dust-light (as in a dust-storm)
Daylight	Barna	Basno, B., (for colour, implying brightness)
Puddle or clay	Khira	Khira, B., (a custard, or thickened milk)
To eat and drink (carouse)	Fetan	Kháoá dáoá, B.
Wine or spirituous liquors	Nepho	Sarab, B., H.
Crowbar (for breaking through a wall)	Chiti	Sindh kati, B.
Oil	Sadar	Yel, B., H.
Torch	Ful	Mosala, B., Ful, B., H. (flowers)
Rice	Demon	Bhat, B., H.
Doll, vetches	Háli	Dâl, B., H.
Flesh	Guli	Mas, B.
Rupee	Falki	Táká, B., H.
Ornaments	Khila	Gahana, B., H.
Woman	Bakrí	Stri, B., H., Bateri, H., (she-goat)
Man	Bakrá	Bakra, H. (goat)
Knife	Pándi	Chhuri, B., H.
To run away	Geme	Goma (Sanskrit, to go)
Battle	Dhot	Goru, B.
Dog	Nelya	Kukar, B.
Thatched house	Kholá	Kholárghar, B. (tiled hut)
Chowkidar	Kokon	Chowkidór, H.
To cease and carry away	Sangi	Sange, B. (in company)
To go away to a foreign country	Chati	Chati, B. (caravansary)
Nika form of marriage	Kali	Niká (Persian)

VIII. — *The Psychological Unity of Mankind.* By C. S. Wake, F.A.S.L.

Whatever decision may ultimately be arrived at as to the actual origin of man, the unity of the human race is evident from a fact which has hitherto attracted little attention. It is a familiar idea, and one which appears to be now accepted as a truth, that "mankind" (a term which, in this relation, has probably been used as synonymous with the Caucasian, or Indo-European, race) resembles in its totality an individual man, having, like him, an infancy, a childhood, youth, and manhood. In the early ages of the world man was in his infancy; and from that stage he has progressed, by gradual steps, until now he may be said to have attained—at least in peoples of the European stock—to a vigorous manhood. That such a development must have taken place, is evident from the consideration that, when we speak of mankind at large, we can only refer to the whole sum of individuals of which it is composed, whose progressive improvement, from generation to generation, constitutes the development of human civilisation. The fact, which appears to have hitherto almost escaped attention, is the present existence of various families of mankind, exhibiting every stage of the supposed development. It is evident that if this can be established, it will furnish an important argument in favour of the unity of mankind.

That a comparison may be made between the intellectual phenomena presented by the several great divisions of the human race, and those exhibited by man in the gradual evolution of his mental faculties, it will be advisable to sketch shortly the several stages in the individual man's intellectual progress. The child, for some time after birth, is simply instinctive in its actions, all of which are directed towards the satisfaction of its own physical wants. With the accumulation of experience, there is the substitution of imitative action for that of instinct; the former, however, although it is necessarily accompanied

by a certain amount of observation having relation wholly to *self*. The exercise of attention is accompanied by that of the *will*, which is the expression of the activity of the mind in relation to external objects. Intimately connected with this faculty is the *cruelty* so noticeable among children, and which may be described as one of the most distinguishing traits of boyhood. Up to this point, the distinction which is generally made between the intellectual and the emotional faculties can hardly be said to have shown itself; as all the actions of the child-life are referable to the instinctive principle in different external relations. If either can be said to have priority, it must be asserted that the intellectual part of man's nature is the first to be developed, aroused by the observation of external objects. After the age of puberty, however, the *emotional* nature becomes more active; and we see the result in the passionate life which marks the youthful period of man's existence. Nevertheless, during this activity of the passions, the intellect is not dormant. Its powers are gradually unfolding; and its activity is exhibited in that simple phase of the imaginative faculty which may be described as the *empirical*. This is the phase which the mind exhibits during early manhood. As the sphere of its activity is enlarged, however, imagination comes to be controlled by the reflective or regulative faculty; and when *reason* has established its influence, man may be said to have attained his actual manhood.

From this sketch of man's mental development, it is seen that it has five chief stages, which may be described as the selfish, the wilful, the emotional, the empirical, and the rational; these several phases will be found to have their counterparts in the mental condition of the several great races of mankind. The two first of these stages have much in common. This is necessarily so, as they display but little mental activity, the difference between them being one of strength of will, rather than of the inner qualities which reveal themselves through external action. We shall be prepared, therefore, to find that those peoples who are in the first and second stages of development exhibit much sameness of phenomena. The race which answers to the lowest stage of man's intellectual progress, is

that which it can hardly be doubted is the oldest as well as the most uncivilised of the races of mankind. It is possible that the aborigines of the Australian continent are not so thoroughly degraded as is generally supposed; but it cannot be doubted that their mental condition is at a lower level than that of any other widespread race. The Australian native certainly displays considerable ingenuity and cunning, and no small degree of skill and activity in war and the chase. A late writer (Mr. Lang) states, that "everything they have to do, they do in the very best manner; and I have observed, that for every contingency that arises they have some simple remedy."* He says further, that "they appear to have discovered the properties of every article fit for food within their reach; and have the power of distinguishing between the useful and detrimental portions of each." One of the most curious facts connected with this peculiar people is, that "every native knows every other native, with whom he has ever come in contact, by the mark of his foot, as surely and conclusively as the detective officer knows every thief, of his acquaintance, by his face." Mr. Lang states, moreover, that the Australian aborigines have a considerable knowledge of astronomy, which extends so far as the dividing "the heavens into constellations, almost identical with those of our own astronomers, and named after various animals."† According to the same writer, "the highest form of their intelligence is exhibited in their poetry and corroborees,—regularly composed operas, accompanied by characteristic music." Notwithstanding these symptoms of intelligence, the whole mental activity of the Australian native may be said to be of a very simple—almost instinctive—kind; and it is combined with moral qualities—or it may rather be said with an absence of them—which leaves no doubt as to the place they hold in the scale of humanity. The writer just referred to, who is far from being prejudiced against them, says, "After a long and careful study of the aborigines, I cannot describe it as anything more or less than that of bloodthirsty savages. So far as the men are concerned, at all events, I

* *The Aborigines of Australia*, by Gideon D. Lang, p. 30. † *Ibid.*, p. 21.

cannot remember any occasion on which they displayed the faintest spark of gratitude or generosity. In short, their disposition is one of unmitigated selfishness."* Pure *selfishness*, then, governed by no idea of "morality", is the ruling principle of the lives of the Australian aborigines; and we see in them the "oldest" of the great families of mankind.

The second stage of mental progress is the *wilful*, and of this the aborigines of the American continent furnish the racial example. A writer in the *Encyclopædia Britannica* thus describes the mental characteristics of this people: "The intellectual faculties of this great family appear to be decidedly inferior, when compared with those of the Caucasian or Mongolian race. The Americans are not only averse to the restraints of education, but are, for the most part, incapable of a continued process of reasoning on abstract subjects. Their minds seize with avidity on simple truths, but reject whatever requires investigation or analysis. Their proximity, for two centuries, to European institutions, has made scarcely any perceptible change in their mode of thinking or their manner of life; and as to their own social condition, they are probably in most respects exactly as they were at the earliest period of their national existence. They have made few or no improvements in constructing their houses or their boats; their inventive and imitative faculties appear to be of very humble capacity, nor have they the smallest taste for the arts and sciences." To this the writer adds, when speaking of the Alleghany Indians, that they have furnished examples of "a high sense of honour, according to their perceptions of duty; mutual fidelity among individuals; a fortitude that mocks at the most cruel torments; and a devotion to their tribe which makes self-immolation in its defence easy. On the other hand, they treat their wives cruelly, and their children with indifference. The apathy, under the good and ill of life, which the stoic affected, is the grand element of the Indian's character. Gloomy, stern, and severe, he is a stranger to mirth and laughter. All outward expression of pleasure or pain he re-

* *The Aborigines of Australia*, p. 32.

gards as a weakness; and the only feeling to which he ever yields, is the boisterous joy which he manifests in the moment of victory, or under the excitement of intoxication. He is capable of great exertions in war or the chase, but has an unconquerable aversion to regular labour." There is much truth in this estimate of the Indian character; but no one can read Mr. Catlin's graphic description of North American Indian life without seeing that some modification of that estimate is necessary. This traveller declares the current idea that "the Indian is a sour, morose, reserved, and taciturn man," to be entirely erroneous. He says that, on the contrary, he belongs to "a far more talkative and conversational race than can easily be seen in the civilised world. . . . No one can look into the wigwams of these people, or into any little momentary group of them, without being at once struck with the conviction that small-talk, gossip, garrulity, and story-telling, are the leading passions with them."* Mr. Catlin adds, that "they are fond of fun and good cheer, and can laugh easily and heartily at a small joke,—of which their peculiar modes of life furnish them with an inexhaustible fund, and enable them to cheer their little circle about the wigwam fireside with endless laughter and garrulity."† This childish mirth is, indeed, quite consistent with the intellectual state of Mr. Catlin's *protégés*. Although ingenious and talented, he admits, nevertheless, that "in *mechanic arts* they have advanced but little," and "in the *fine arts* they are, perhaps, still more rude, and their productions are few." When to this is added, that "the North American Indian is everywhere, in his native state, a highly moral and religious being,"‡ and that he is "by nature decent and modest, unassuming, and inoffensive;" we must recognise the conclusion, drawn by Mr. Catlin from these premises, that "the Indian's mind is a beautiful blank on which anything might be written,"§ as a fair one. This character may be thought to be rather too highly coloured; but it has its dark side in the *cruelty* which Mr. Catlin admits to be one of its

* Catlin's *North American Indians*, vol. i, p. 84.
† *Ibid.*, p. 85.
‡ *Ibid.*, vol. ii, p. 243.
§ *Ibid.*, p. 245.

leading traits. This is seen more especially in the treatment of prisoners of war, and in connexion with certain religious ceremonies. This trait is, however, only incidental to the more general characteristic of strength of *will*, which the North American Indian so peculiarly exhibits. This is seen in his endurance under hardship and suffering, in the incidents connected with his mode of warfare, and even in his political independence, which is almost absolute.

Now, much of Mr. Catlin's description of the character of the North American Indian is, allowing for the difference in the conditions of their existence, perfectly applicable to the character of the civilised man in the boyish stage, when his passions are not yet fully developed. At this stage the will —guided in its operation by the mind, becomes active, within a limited range, in relation to external objects, as distinguished from the mere selfishness of the child—has the chief sway over man's conduct. This phase of mental activity has, however, much in common with that which precedes it. The selfish nature is predominant in both of them; but in the one case its action is almost purely instinctive; whilst in the other, it is accompanied by a certain mental activity in relation to external nature, which gives intensity to the will, without altering the end, towards the attainment of which its operation is directed. A natural result of this strength of will, guided as it is by contracted thought, is the cruelty which is a distinguishing trait, as well of the childish mind as of the lower races of mankind. So characteristic is this trait, that it might almost be said that the human mind passes through a "cruel" phase. It is, however, simply the thoughtless activity of the wilful "self," and its continuance is usually coextensive only with that of the thoughtlessness which gives to selfish action its abhorrent character,—a thoughtlessness which exhibits itself, moreover, in the buoyant mirth which is a not less distinguishing mark of early boyhood than it is, according to Mr. Catlin, of the North American Indian in his natural state.

The third stage of mental development through which the human being passes is the *emotional*, and we see its closest counterpart in the mental condition of the Negro race. The

emotional nature of the Negro is now so well known, that little proof of this analogy is necessary. Sufficient evidence of this is furnished by Dr. Hunt, in his pamphlet entitled *The Negro's Place in Nature.* Dr. Hunt cites Dr. Pruner-Bey, as saying, "The capacity of the Negro is limited to imitation. The prevailing impulse is for sensuality and rest. No sooner are the physical wants satisfied, all psychical effort ceases, and the body abandons itself to sexual gratification and rest. The family relations are weak; the husband or father is quite careless. Jealousy has only carnal motives; and the fidelity of the female is secured by mechanical contrivances. Drunkenness, gambling, sexual gratification, and ornamentation of the body, are the most powerful levers in the life of the Negro." Although this cannot be accepted as a fair description of the character of all the African peoples, and although it requires to be somewhat qualified even in relation to the Negro; yet as to the latter, it must be taken as being generally true. In comparing this stage of human progress with that of the individual man, it must not be supposed that the description just given expresses the true phenomena of the youthful life. It cannot be denied, however, that youth is the period when the emotional nature is predominant, and when the passions are most active. The influences of race and of individual education in great measure control the operation of the passions among civilised peoples; but *subjectively,* the youthful phase of the civilised mind is exactly similar to that which is observed among the Negroes as a race. There is one characteristic of the African mind which deserves notice, as showing that the Negro is, nevertheless, not purely an emotional being. Captain Burton declares that "exaggeration is the characteristic of the mind of both the East and West African." He says, when speaking of the coast-clans of eastern Africa, "Supersubtle and systematic liars, they deceive where duller men would tell the truth; the lie direct is no insult; and the offensive word *muongo* (liar) enters largely into every dialogue. They lie like Africans, objectlessly, needlessly, when sure of speedy detection, when fact would be more profitable than falsehood; they have not discovered, with the civilised knave,

that 'honesty is the best policy'; they lie till their fiction becomes, subjectively, fact. With them the lie is no mental exertion, no exercise of ingenuity, no concealment, nor mere perversion of the truth: it is apparently a local instinctive peculiarity in the complicated madness of poor human nature." This curious phase of the uncivilised mind is due to the absence or, at least, the weakness of the moral sense; and although, as Captain Burton asserts, it requires no mental *exertion*, it is, nevertheless, proof of a certain degree of mental *activity;* and it serves as a connecting link between the Negro and the race next above him in the progressive development of mankind. It may be added, as forming another such link, that, however, careless the African peoples may be of human life, they are not, except, perhaps, among some of the lowest tribes, naturally *cruel*; superstitious fears and observances often make them so; but their ordinary nature is rather mild than the reverse.

Analogy has thus been traced between the *selfish*, the *wilful*, and the *emotional* phases of the human mind, and the characteristics of certain races of mankind. These several phases may be all classed together, as being gradual development of man's *sensuous* nature. In each, however, there is necessarily a certain admixture of "intellectual" activity; and we have now to consider the *empirical* phase which distinguishes the mind of the European in the stage of early manhood. At this stage the mind has attained to considerable activity; but the regulative or rational faculty not being yet fully developed, its operations are empirical in their result, as being guided only by the simple teachings of experience. The great division of mankind which—the most perfectly—exhibits this mental phase, is the Asiatic or Turanian. M. Guyot, in describing the mental characteristics of this race, says, "With it the melancholic temperament seems to prevail; the intellect, moderate in range, exercises itself upon the details, but never rises to the general ideas, or high speculations of science and philosophy. Ingenious, inventive, full of sagacity for the useful arts and the conveniencies of life, the Mongolian, nevertheless, is incompetent to generalise their application. Wholly turned to the

things of earth, the world of ideas, the spiritual world seems closed against him. His whole philosophy and religion are reduced to a code of social morals, limited to the expression of those principles of human conscience, without the observance of which society is impossible."* We have here the description of a people whose mind has become extremely active in relation to the simple phenomena of external nature, and the knowledge thus gained to the satisfaction of the physical wants of life. The observation of the facts on which science is founded, and the great advance made by the Chinese, for example, in the useful arts, prove that the intellect has, with them, attained to a considerable degree of activity. The inability, however, of the unassisted Asiatic mind to form an absolute *science*, is evidence that the mental development exhibited is still imperfect. This phase of intelligence is, indeed, that which Mr. Mill affirms the great mass of civilised mankind to exhibit throughout life,—the reasoning from particular to particular without the intervention of general ideas. The absence of science is simply owing to the inability to recognise general truths, which is a characteristic of the Asiatic mind. The want of the regulative or rational faculty is, however, attended by curious results. The mental activity not being controlled by the reason, *imagination* exerts more than its legitimate influence; the greatest exaggerations are indulged in; thus making unreliable so much of oriental history. Deceit, which with the Negro is the result of mere caprice, becomes with the Asiatic, oblivious as he is of the requirements of morality, a legitimate exercise of the intellect. We see, without doubt, in the oriental mind, the empirical stage of the human mind,—that phase in which the actions of life are the result of the application, not of the generalisations of moral or scientific truth, but of the particular teachings of experience without the intervention of any process of strict scientific induction. It would seem, indeed, as though the Asiatic mind were incapable of originating any further advance in civilisation. M. Guyot says of the Hindoos and Chinese, that "these nations offer us the astonishing

* *Physical Geography* (1850), p. 179.

spectacle of civilised communities remaining perfectly stationary. Three thousand years of existence have made no essential change in their condition,—have taught them nothing,—have brought about no real progress,—have developed none of those great ideas which effect, in the life of nations, a complete transformation: they are, as it were, stereotyped."*

In the intellectual phase exhibited by the Hindoos, there is, nevertheless, a great contrast to that of the Chinese, notwithstanding they have much special resemblance. The writer just referred to asserts that, "endowed with a higher intelligence, with a power of generalisation, with a profound religious sentiment, the Hindoo is the opposite of the Chinese; for him the invisible world, unknown to the Chinese, seems alone to exist. But the influence of the climate of the tropics gives to the intuitive faculties an exaggerated preponderance over the active faculties. The real, positive world disappears from his eyes. Thus, in his literature, so redundant in works of philosophy, of poetry and religion, we seek in vain for the annals of his history, or any treatise on science, any of those collections of observations so numerous among the Chinese. In spite of these defects, the Hindoo civilisation, compared to that of China, bears a character of superiority which betrays its noble origin: it is the civilisation of the western races transported and placed under the influence of the east."† This influence shows itself in a faculty of exaggeration and a practice of deceit, similar to those exhibited by the Chinese. The Hindoo intellect may, indeed, be said to differ from that of the Chinese rather in the objects of its thought than in the faculties which show their activity. Empirical thought is that which governs the civilisations of both these peoples; but whilst in the one case it has for its object the simple experiences of life; in the other, it almost overlooks the mere facts of science, and becomes active about the first principles of nature itself. The Chinese mind deals with the phenomena from which the inductions of science are to be made, stopping short, however, of such inductions; whilst the Hindoo intel-

* *Physical Geography* (1850), p. 181. † *Ibid.*, p. 180.

lect constructs its systems, without any reference to the phenomena from which alone can be educed the generalisations of true science.

We see in the Hindoo intellectual phase the foreshadowing of the fifth and, it may be, the final stage of human mental progress. With this intermediate type, the rational faculty has begun to assert its supreme authority; but having no sufficient data for its exercise, its conclusions partake of the imperfection of the premises from which they are drawn. In the European intellect we see exhibited all the phenomena which distinguish the *rational* stage of man's mental development. It may be thought unnecessary to give proofs of a fact so indisputable; but the language of M. Guyot on this point is so just that it cannot be omitted. He says: "Christian Europe beholds poetry, the arts, and the sublimest sciences, successively flourish, as in the bright ages of Pagan Greece; but, enriched already with the spoils of the past, culture is far more comprehensive, more varied, more profound; for it is not only affluent with the wealth of the days gone by, but Christianity has placed it on the solid foundation of truth. The spirit of investigation ranges in all directions; it adds to this brilliant crown a new gem, the science of nature, which grows with a speed of which the ancient world had not even a forecast. Unriddled by the spirit of man, Nature has yielded up to him her secrets; her untiring forces are enlisted in the service of intellect, which knows how to guide their action for its own purposes."* Whether the full development of the European intellect is due to the influence of Christianity, as M. Guyot supposes, or whether Christianity itself is part of the great intellectual progress exhibited by the Caucasian race, is of little moment to the present argument. The fact cannot be denied, that the full manhood of humanity expresses itself only in this the youngest and most perfect of the races of mankind.

The progress of man has thus been traced through his various race-developments; and it has been shown that representatives of the several stages still linger on the earth. If this be so,

* *Physical Geography* (1850), p. 201.

several important inferences may thence be drawn. In the first place, if it be true that the European or Caucasian race exhibits a phase of mental development, the progressive stages towards which are exhibited by other races of mankind, we are justified in believing that, before the former could have reached its perfect stage, it must have passed through all the intermediate ones. We may therefore suppose that the past phases of development of the European race, can be reproduced by observation of the present condition of the less perfect races of man. According to this view, in the Australian aborigines we have examples of the primitive state, not only of the European, but of all other races. This is, however, subject to great qualification, seeing that the very fact of superior races having made so much further advance in civilisation than those below them, proves that the peculiarities of inferior peoples, which constitute their race-characters, can never have been so strongly marked in those above them. This consideration leads to the further conclusion, that the present imperfection of inferior peoples is not necessarily introductory to the more perfect development exhibited by the European. In a former paper, I endeavoured to show that the source of the inferiority of the lower races of mankind is to be sought in the long-continued persistence of conditions of nature unfavourable to the perfect development of the physical and mental organisms, which has finally resulted in a state of arrested growth, such as those races exhibit.

We have in this a reason why the inferior races should not be able to attain to the perfection of development of the European,—an inability which must be the most apparent in the lowest variety of mankind, seeing that the longer any physical or mental state continues, the more habitual or fixed does it become. Probably, in the case of the Australian and American aborigines, and also of those races, remnants of which are found in the Hottentots and Eskimos, these states have become so fixed that they cannot be altered. The Negro and the Asiatic forms appear to be less fixed; and yet they are apparently incapable of making any further progress *from within*. If this is to take place, it must have its origin *from without;*

and it is reserved for the European race, not only to exhibit the most perfect phase of human civilisation, but to impress that civilisation on the older races of mankind.

If the view of the progress of mankind here insisted on be correct, and if there be a correlation of the physical structure of a people and of the mental peculiarities they exhibit, race-characters must originally have been of merely secondary importance; and they can have become of primary importance only when fixed, as the result of persistence of certain external conditions through a long period of time. No doubt it is owing to this persistence that certain characters are now so marked as to be strictly racial. It may, certainly, be objected that even supposing the primitive equality of all the races into which mankind is now divided, it does not necessarily follow that they must have had a common origin. There is apparently no reason why mankind should not have descended from one hundred ancestors instead of from one only. If, however, the idea of the plurality of *races* be got rid of, as it must be, if the ancestors of all races were originally on an equality, the *reason* for requiring a plurality of origins must go with it. The more so, as the lapse of time is as competent to account for the universal spread of man over the globe, as the formation of the races into which mankind is now divided. It is undoubted that a very long period has been required for the latter process; and as, on the supposition of man's primitive equality, all races must have had an equally distant origin in time, there is nothing to render it unlikely that, as those races are traced back to their common type, they are also being traced up to a common source.

It is objected, however, that we have no evidence in history of the origin of races; and that we must, therefore, suppose them to have always existed as such, and mankind, consequently, to have had several centres of origin. This argument in favour of original plurality of race, however plausible, is of little value, seeing that it is purely negative. The fact of history being silent on the subject, is no proof that races have not been actually formed; it may have been, and doubtless was, throughout a period long antecedent to that which even

the oldest tradition can reach. There are, moreover, two difficulties connected with the idea of an original plurality of races, which render its truth highly improbable. The legitimate conclusion to which it leads is, that every country has had its own autochthones; and that man, therefore, is sprung from not one, or three, but from *hundreds* of ape progenitors! For the *ape* origin of man would seem to be essential to the scientific belief in the original plurality of race. This conclusion is unsatisfactory enough; but is hardly more so than—supposing the ape origin of man—to assert that the Caucasian race has not sprung from the Mongolian or from the Negro stock, but from an ape; seeing that while the latter differs from man so much more than it resembles him,—the European and the Negro, even, resemble each other so much more than they differ;—it is vastly more probable that the superior has been derived from an inferior human type than that it has been derived from an ape. It is probable, however, that the Caucasian race has not sprung from any other of the existing human races, but that it has been derived from some older race, of which each of the existing families of mankind represents some special phases fully developed. All the branches must, however, meet in the primitive stock before the common ancestor is reached, if they are traced down low enough; and it is more reasonable to suppose that the Caucasian race has sprung from even the lowest or earliest type of humanity;—even though *its* immediate progenitor were an ape,—than that the former had an independent ape origin.

IX. — *The Indians of the Mosquito Territory.* By John Collinson, C.E., F.R.G.S., F.A.S.L., etc., etc.

In 1863, I read before the British Association Meeting, held at Newcastle-on-Tyne, an account of my explorations and survey, during the same year, in the Mosquito territory of Central America. Since then I have, besides traversing Nicaragua from lake to ocean, repeated my visit to the Mosquito country, and spent considerable time in exploring its rivers, lagoons, and impenetrable forests. The present brief paper has in view the communication of some interesting facts picked up at odd times during these two expeditions, relative to the manners, customs, and languages of three out of the seven aboriginal tribes who people its shores and vast forests.

The Mosquito Indians consist of seven distinct tribes; viz., Mosquitos, Woolwas, Ramas, Valientes, Cookwras, Tongas, and Poyas; but as my dealings were almost exclusively confined to the three first mentioned, the information I now communicate will relate to them alone. Commencing with a brief outline of their respective physical traits, I shall deal with the Mosquito tribe first.

These Indians are by far the most intelligent and enlightened of all the tribes,—a result attained by the indefatigable efforts of the Moravian missionaries, who have established several of their stations along the coast; and from the greater accessibility of the Mosquitos have more especially directed their efforts, in the first instance, to their civilisation and the abolition of the barbarous ceremonies so common among them. The personal appearance of the members of this tribe is decidedly good, when uncontaminated by the diseases introduced among them by traders, etc., from the civilised Old World. Though their stature is short, rarely if ever exceeding five feet eight inches, they are strongly made, and can endure a continuance of fatigue much better than their larger neighbours, the Woolwas. This I attribute to their more decent mode of living, induced

by the missionaries, which has caused the traders of the coast to seek for more congenial boon companions for their sensual revels among the less enlightened tribes. The complexion of these people is very dark, with finely cut features, noses small and straight, cheekbones high, and hair long, coarse, and thick, falling from the crown equally over head and face, no attempt being made to keep it off the latter. For clothes, the more civilised wear any article of European clothing they can pick up; while the others content themselves with a piece of native cloth round their loins, called "toonu".

The king of the entire territory is an hereditary chief, and is obliged by law to be a pure Mosquito, the title descending regularly from father to son, or in failure of direct issue to the nearest relative, who is a member of the royal tribe. The last king, my companion for some time, while exploring the country, was a good specimen of what an enlightened Indian can become. His education, received at Jamaica, was quite equal to that of an ordinary English gentleman. With it he had acquired a refined taste, hardly to have been expected; he was never without one or two volumes of our best English poets in his pocket, and availed himself of every unoccupied moment to peruse them. But I do not want it to be supposed that civilisation had made him effeminate in the slightest degree; on the contrary, he was the best shot, and canoe's man in the whole country; and though regarded by his people with the affection of children for their father, his slightest word or look was law, and woe to him who disobeyed either. I am sorry to say that this exemplary monarch is no more.

The Woolwas, who come next, are, in my opinion, the most interesting of all the tribes, they are still almost in their pristine state of barbarity; some of their number, who were working for me in the bush, had actually never before seen a white man.

These people follow the curious custom of flattening the heads of their children in infancy, practised also in some parts of North America: and as they wear the same long hair as the Mosquitos, but instead of allowing it to cover the face, have it cut in a straight line just above the eyes, and as far back as

the temples, their countenances have a peculiar appearance, more as if cut out of a block of wood, than created of natural flesh and blood. Their cheek bones are very high, eyes black and glittering, like most Indians, and complexions swarthy. Their other features are, of course, completely spoilt and altered from their original form, by the compression process. Both these tribes are dreadfully subject to cutaneous affections, and especially leprosy; with the exception of the king, I never saw a perfectly clean skinned man among them.

The sole garment indulged in, by both men and women alike, is the "tas," a cloth made out of the bark of the India rubber tree (*Castilloa elastica*), similar to the "toonu" of the Mosquito men, only much wider. It is twisted round the loins, and, after fastening in front in some wonderful manner, both ends are allowed to fall down and form a broad flap. They are very fond of painting their faces with a beautiful carmine, extracted from a shrub called "arter" (*Bignonia chica*). On festal occasions wonderful figures are drawn on their countenances with this colour.

We now come to the Ramas, a very fine race of men, some indeed of Herculean stature and strength, and dreaded alike by both Mosquitos and Woolwas. From the specimens I saw, a stature of six feet does not seem to be at all uncommon among them. The remnants, however, of this once powerful and numerous race, which formerly peopled the San Juan, Rama, and Frio rivers, besides many smaller intervening ones, and struck terror into the minds both of the Spanish conquerors and the other Indians by their ferocious character and reputation as cannibals—have, I suspect, a strong admixture of negro blood in their veins, as, like the Caribs, they often have moustaches, which seem to arise among the denizens of tropical America only after the intermixture of different races. These men, though reputed so fierce, are yet intelligent above ordinary wild tribes, most of them speaking English well. Their countenances are serious and stern, and give one the impression of much thought devoted to brooding over their country's wrongs. The dress worn by them is very similar to the Mosquito costume, viz. the inevitable "toonu," accompanied by any European

garments attainable, without much regard to their proper position on the human form as regulated by fashionable tailors.

A general description of the characteristic traits and appearance of these tribes having been given, I shall now detail a few of the most interesting ceremonies and customs, originally practised by all alike, but now fast falling into disuse among the Mosquitos.

Their religious observances seem to be confined to invocations, interrogations, and propitiations of devils and evil spirits; that good spirits or gods exist is their belief, but they consider the evil ones to be much their superiors, and in all cases of difficulty they fly to supplicate the latter and not the former. A belief in a future existence is entertained among them, and after a death the canoe of the departed is cut across in the middle, the corpse placed in it so that he may have no difficulty in getting out at one end, and then buried under his house, in which are deposited plantains, bananas, and corn, and a porous jar filled with water. The provisions are for the spirit on its way to the happy hunting grounds, and the token of departure is the disappearance of the water from the jar.

The most important and barbarous of their ceremonies is a religious drinking orgie (very similar to the feasts of the Jurias of South America, described by Humboldt) celebrated in the following manner. Invitations are sent out in great numbers, but always to members of the same tribe, to take part in the proceedings. At the stated time, those invited, accompanied by their wives, assemble, decked out with feathers and beads, and smeared over with paint, so as to become perfectly unrecognisable. They then paddle in their canoes to some out-of-the-way spot, chosen for its solitude and the improbability of intrusion. There, huts of branches and palm-leaves are hastily erected, and the women set to work in them, to prepare a filthy and highly intoxicating drink, called "mishla," made as follows:—large supplies of ripe plaintains, cocoa nuts, cassava, and pine apples are provided, which are first chewed by the women, and then spit into troughs dug out of logs. The saliva, conjoined with the influence of a tropical sun, speedily produces fermentation, when the disgusting mess is ready for consumption. The men,

meanwhile, have removed themselves about a quarter of a mile from the women's huts, and cleared out a space of ground. Each man then carved for himself a small pipe (burnt on conclusion of the ceremonies, as too sacred to be beheld by profane eyes) on which they play, accompanying themselves by dancing and singing, which grow more boisterous and rapid as the excitement caused by the exercise arouses them. This is their invocation to the Devil, with whom they pretend to hold converse, and receive information relative to present and future events. Each individual keeps this up until he falls to the ground from utter exhaustion, when he crawls to the women's camp, drinks as much "mishla" as he can swallow, then returns and rejoins the other revellers. This goes on, without cessation, for three or four days, when all return home to sleep off the baneful effects of their dissipation, which not unusually produces a state of temporary insanity. No woman is allowed to see anything of what is going on, under a penalty, rigidly enforced, of immediate death.

Another very common and favourite method of unravelling the unknown, is an incantation, by a "sookia" man, (who possesses a reputation as Doctor of Medicine, as well as diviner.) He commences operations by cutting a small wand, peeling it, and tying a short string to its top. He then strokes it repeatedly, muttering in an undertone words supposed to form an incantation; after this has been done for some time, one end of the stick is placed in the left elbow, and the right arm is stretched out to the string end; if it exactly reaches this when extended to its full length the wand will reveal the truth, if not the string must be altered and the process repeated until it is in its right position. Questions, relating to the present and future, will then be answered the "sookia" man, correctly as he states, though I must confess that the queries I propounded were never replied to very successfully, but I was an unbeliever, and it is a notorious fact that spirits are put out of their calculations by the incredulous.

A foolish custom, still very generally prevalent among the people, is the marriage ordeal, to which every youth must submit when he aspires to the dignified position of a married man.

Notice having been given of the youth's desires, a day is fixed, and all the married men of the tribe assemble, when the luckless aspirant stands in the midst, bending down his bare back, and submits to the ordeal, which consists of a dreadful beating, administered by each beholder in turn, with his elbow, a formidable instrument in the power of a heavy man, the use of the fists being entirely unknown.

Should the sufferer be unpopular he is very lucky if he escapes with his life, and, indeed, I have been credibly informed that many fatal cases have arisen from this inhuman practice. The ordeal undergone, liberty is vouchsafed to marry as soon as he has sufficiently recovered from its effects.

To counterbalance this rite a man has great power over his wife after marriage. Should he return home after a journey and suspect her of faithlessness, he binds her by her hands and feet to a tree, beats her with a club, and even gashes her with a knife, until she accuses some man of being her lover. She is then released, and the husband proceeds to the accused's residence, and gets damages out of him by driving away and taking possession of any cattle he may possess.

This law is without appeal, and, as may be supposed, leads to frightful abuses; the woman's word after submitting to the torture cannot be gainsaid, and ill-will, or the desire for some coveted possession, is quite sufficient for calling it into action.

I must not omit mention of a superstition founded on the supposed existence of a gigantic species of serpent. These mythical reptiles are called "Wowlvahs," and are believed by the natives to inhabit certain out-of-the-way swampy pools and marshes, where they grow to an enormous size, live for ever, and have the capability of swallowing a canoe full of men at a time. No Indian will stop near their supposed abode for fear of arousing their anger, and so compassing his own destruction.

The "sookia" men above mentioned, conjoined with the exercise of a certain amount of practical knowledge of doctoring, make use of charms and incantations against sickness, painting a lot of devils on sticks, with which they assume they can, by fencing round the sufferer, keep off the aggressive devils who are assailing him. They also tie charmed sticks on their cacao

and other trees, to keep birds, animals, and even men, from plundering them.

Where all these inhabitants of Mosquito originally came from is difficult to say; but that they were at any former time one people is exceedingly improbable, and could be disproved by the fact alone of their speaking such utterly distinct and different languages. Since we can obtain any records of them, they have ever been a fierce and marauding race, resisting subjugation successfully, with every man's hand turned against his neighbour's. My impression is, not that they originally peopled their present strip of territory, which, had such been the case, must necessarily show—as it does not—some remains and proof of their ancestors' existence; but that each tribe came severally, and at different times, from various parts of the continent, north and south. Races like the North American Indians of to-day, to whom civilisation is impossible, and gradually driven back by the fruitfulness and increasing numbers of the more adaptable and improving races, sought refuge in the fastnesses and pathless forests of the Mosquito country. To support my theory, the Caribs, expelled* of recent years from the gulf islands where they formerly dwelt, have come in this manner to the Mosquito coast; and though preserving, like the other tribes, their mother tongue intact, are yet settling down as another race and tribe, to add to the number of the Mosquitos.

I have appended to this paper two vocabularies,—one of the Mosquito, and one of the Woolwa tongue; some of the words in the former have, I believe, been published before; but, I think, I am correct in stating that the present one is the only Woolwa vocabulary yet known in Europe.

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* Caribs deported from St. Vincent to Roatan, in bay of Honduras, by the English, in number six thousand, A.D. 1796.

WOOLWA VOCABULARY.

Libra, *Woolwa people.*
Wahi, *brother.*
Al, *man.*
Yel, *woman.*
Sirou backar, *girl.*
Al backar, *boy.*
Yalki, *wife.*
Alkimuk, *husband.*
Aslar, *one.*
Bou, *two.*
Bas, *three.*
Aroonca, *four.*
Seenca, five.
Deecca, *six.*
Yecca, *seven.*
Bachca, *eight.*
Tingnicasla, *nine.*
Tingniskoobou, *ten.*
Pamki, *tapir.*
Nowar powka, *red tiger.*
Nowar, *tiger.*
Powka, *red.*
Nowar bulka, *spotted tiger.*
Burruska, *black.*
Pichca, *white.*
Simna, *deer.*
Sowie, *wari.*
Cassi, *to eat.*
Caskouting, *eating.*
Deekoting, *drinking.*
Soopokoting, *sucking.*
Deeko, *to drink.*
Yappoo, *alligator.*
Kahama, *iguana.*
Was, *water.*
I warra, *come here.*
Baina warra, *come here quick.*
Yowanakou, *let us go.*
Koorring, *canoe.*
Wahinah, *paddle.*
Koobil, *knife.*
Seeban, *bow and arrows.*
Keeddak, *axe.*
Oorrus, *monkey.*
Wummi, *Curassow (turkey).*
Wunkuruman, *guan (small turkey).*
Woomalo, *partridge.*
Moolakoos, *peccari,*
Yamka, *good.*
Dootka, *bad.*
Awai, *yes.*
Eessou, *no.*
Aissou, *none.*
Ahmakouting, *sleeping.*
Meouhka ahmakouting, *to sleep.*
Toonik, *head.*
Tas, *cloth worn round loins.*
Kalki, *foot.*
Kinki, *hand.*
Wakki, *plantains.*
Inkkini, *bananas.*
Um, *corn.*
Sussunka, *beads.*
Simming, *fish-hook.*
Sooksuwookka, *cord.*
Asnar, *cloth.*
Soobba, *pot.*
Watikah, *banana bird.*
Vecah, *hare.*
Kee, *rock.*
Sou, *ground.*
Son assung, *world.*
Nowal, *devil.*
Waikou, *God.*
Mah, *sun.*
Waikoo, *moon.*
Mahbruska, *sky.*
Waslouti, *rain.*
Ewi, *to die.*
Yowahkooting, *to walk.*
Yoolbutiang, *to talk.*
Mahdi, *to-day.*
Yun, *to-morrow.*
Dummi, *yesterday.*
Koo, *fire.*
Koolaka, *firewood.*
Pun, *wood.*
Quassika, *hammock.*
Keettung, *waterfall.*
Tookwunnah, *big.*
Ki, *mine.*
Yungdecki, *yours.*
Washbiloo, *mishla (intoxicating drink).*
Moohiwah deekana, *his.*
Amiseeka, *sister.*
Passingka, *father.*
Mamaka, *mother.*
Kahaloo, *shirt.*
Kahasong, *trousers.*
Coocoo, *cocoa-nut.*
Almuk, *male.*
Tooroo,* *cattle.*
Pamka, *horse.*
Boorroo,* *donkey.*
Mulah,* *mule.*
Malakah, *Indian rabbit.*
Kookmik, *armadillo.*
Hoombooka, *bird.*
Ooli, *turtle.*
Taspool, *Indiarubber.*
Deehlatookuting, *cooking.*
Pun, *tree.*

* Evidently corruptions from the Spanish.

Wayahal, *Mosquito man.*
Waya yel, *Mosquito woman.*
Sooktuk, *calabash.*
Mahboutoring, *fighting.*
Was, *river.*
Tooki, *mouth.*
Meekduka, *eyes.*
Anaki, *teeth.*
Tapahki, *ears.*
Bas, *hair.*
Koomah, *salt.*
Koomhoo, *rabbit.*
Backar kee, *children.*
Oo, *house.*
Assun, *hill.*

MOSQUITO VOCABULARY.

Narra bal, *come here.*
Eine, *make haste.*
Kaiser, *let us go.*
Douce, *stick.*
Yerri, *long.*
Kumi, *one.*
Wal, *two.*
Yumpa, *three.*
Walwalun, *four.*
Matasip, *five.*
Mata walkaby, *six.*
Mata walkaby kumi, *seven.*
Matawal wal, *eight.*
Matawal yumpa, *nine.*
Matawal sip, *ten.*
Youan eiske, *twenty.*
Youan eiske wal, *forty.*
Clucki, *cut.*
Brebal, *bring here.*
Yany, *mine.*
Man, *your.*
Eisiken, *father.*
Yapti, *mother.*
Mooine, *eldest brother.*
Deevra, *youngest brother.*
Lakreka, *sister.*
Tahte, *uncle.*
Yapti deevra, *aunt.*
Damer, *grandfather.*
Kookah, *grandmother.*
Pearker, *widow.*
Mair, *wife.*
Mair waikna, *husband.*
Mairen, *woman.*
Waikna, *man.*
Lilla, *mistress.*
Almuks, *old man.*
Hupla, *people.*
Mehi, *friends.*
Pies, *eat.*
Ploom, *victuals.*
Dies, *drink.*
Lia, *water.*
Lia kowta, *cold water.*
Wano, *come along.*
Apia, *no.*
Aou, *yes.*
Yabra, *north.*
Blanco, *south.*
N'emopera, *go this side.*
Passer, *wind*
Keero, *knife.*
Rakboos, *gun.*

List of Articles exhibited on the Table.—Sookia—used to protect cacao-trees. Bows—one of "soupa" palm, one of "ouka". Fighting Arrows—sugar-cane blossom tipped with "soupa" and iron points. Wari Arrow—ditto, ditto, ditto. Fish Arrows—ditto, ditto, with iron points. Silak—turtle harpoon, shaft of "soupa". Line for ditto—silk-grass. Turtle Harpoons. Fish Harpoons. Turtle Shell—turtle of commerce (hawkbill). Scales of ditto. Machete—cutlass. Stone Candlestick. Sheet of indiarubber. Lances—used for fighting and killing large game. Toonu—native cloth made from india-rubber tree bark worn round the loins. Flutes. Pnack—bead necklace. Soumis—native clay-pots for cooking. Dress teeth. Kukwasbara—used for calling animals. Pitpan—canoe. Rusbara—pot-spoon. Shukkah. Yulsirpi. Mawa Ulbika—used to paint the face with.

X.—*On the Saracens in France, especially in Burgundy and Lorraine.* By Dr. Gustave Lagneau. (Translated by E. Villin, F.R.S.L., F.A.S.L.)

The Saracens came out from Arabia, and after having successfully subdued the nations of Northern Africa and Spain, began their incursions beyond the Pyrennees as early as A.D. 715.* Their armies were composed, not of Arabs only, but also of Moors, Kabils, or African Berbers, and Jews, at that time numerous in Spain.† In an anthropological point of view, these diverse races vastly differed in characters; for even now the Arab and the Kabil, living in Algeria, vary very sensibly. "The Berber," says M. Pruner-Bey,‡ "is generally distinguished from the Arab by a higher stature, by a cerebral and facial cranium broader in its transverse diameter; his forehead is more vertical, well developed in every direction, and little produced; his eyebrows are less arched, and are sometimes nearly united together. The jaws are entirely orthognathous. The Berber has less delicate features than the Arab. The craniometrical mensurations, taken by one of our colleagues§ on eleven Arabian heads and fourteen Kabil heads, fully confirm these differences."

Up to A.D. 759, when the Frank King Pépin took Narbonne, the Saracens occupied Septimania, overran the Albigeois, Ruergue,

* Reinaud, *Invasions of the Saracens into France and into Savoy, Piedmont, and Switzerland*, 1836, Paris.

† *Ibid.*, pp. 7 and 240. Depping, *The Jews in the Middle Ages*, 1834, p. 31.

‡ *Mémoirs de la Société Anthropologique de Paris*, vol. i, pp. 413, 414.

§ "Results of Craniometry," *Mémoires de la Soc. d'Anthrop.*, v, 11, p. 432.

	Antero-posterior diameter.	Biparietal diameter.	Horizontal circumference.	Relation of Longitudinal & transverse diameters.
Berbers, Kabils, and Moors	184	138	526	1000 : 760
Arabs - - - -	178	135	505	1000 : 759
Jews - - - -	175	131	486	1000 : 750

Gevaudan, and Velay provinces, and advanced northwards, both into Burgundy and beyond Poictiers.

The small peninsula, Le Véron, at the confluence of the Vienne river into the Loire, is, to all appearances, still inhabited by the descendants of some Saracens who escaped death at the battle fought between Charles Martel and Abd-erah-mam, near Poictiers. They are still remarkable for their dark complexion, elongated faces, very black hair, and melancholy.*

The Médoc "Landes" were likewise a district of refuge for the vanquished dispersed after this long battle by "Eudes," duke of Aquitaine, and, according to tradition, they built the village of Vendays, the inhabitants of which are still at present distinguished by features very typical of the east. Their women are remarkably beautiful. Even their horses are still considered of Arabian race.†

Doctors Russière and Vincent‡ have equally noticed in the "Creuse" department, near Châtillon, in the neighbourhood of Montmaury (or Mountain of the Moors) inhabitants of a high size, light frame, dark brown skin, nervous temperament, lively imagination, and apparently descended also from Arabian fugitives, some of whom had introduced carpet making at Aubusson.

When the Mussulman armies were obliged to recross the Pyrenees, numbers of Saracens remained in France. Charlemagne gave, to those Saracens who became Christians, lands in the vicinity of Narbonne. Some ancient families of Languedoc consider themselves of that origin.§

At a later period, these Saracens, after having occupied Camargue, settled in A.D. 889 at the Castle of Fraxinet (now the village of La Garde Frainet) in the Gulf of Tropez, near mountains there again called Mountains of the Moors. In the same manner in the Maritime Alps, Esa built in terraces on a steep rock‖ the

* Fodéré, *Voyages aux Alpes Maritimes*, p. 68, Paris, 1821.

† "Le Littoral de la France"; "Elisée Reclus"; *Revue des Deux Mondes*, Août, 1863.

‡ F. Vincent, "Etudes d'Anthropol. sur le Département de la Creuse", *Bulletin de la Soc. des Sciences Naturelles d'Anthrop. de la Creuse*, vol. iv, p. 50, 1865.

§ Reinaud, vol. i, p. 97, etc. ‖ *Magasin Pittoresque*, p. 118, 1861.

St. Hospice Peninsula; Bordigher,* where palm trees are grown, and some other districts of the Littoral, became stations of Saracens. In A.D. 941 Hugues, king of Italy and Provence, made over to them lands in the Hills of Maurian, of Tarantaise, and Faucigny.† From their mountains they spread into the plains of the south-east of France. Being driven from the environs of Grenoble, about A.D. 965, Guillaume, count of Provence, caused them the loss of the Castle of Fraxinet;‡ but they were expelled from the Savoy Mountains only in the eleventh century.§ At the present time there still exist descendants of those Saracens between Annecy and Chambéry in the plain of Bauges.‖

According to Fodéré,¶ the elephantiasis of the Arabs, observed in Provence and in Liguria, is the sad inheritance of these easterns.

As to the Saracens of Burgundy, they appear to have invaded that region during the eighth century, after having massacred, in the Velay in A.D. 729, St. Théofrède, abbot of Amnoric, now "monastier;"** whilst, in the meanwhile, the Alp Saracens made frequent irruptions into the plains of the east of France. Dom Mabellon records that they destroyed, in A.D. 782, the Convent of Ile Barbe at Lyons ("Apud Lugdunum Insulæ-Barbaræ Monasterium").††

Lately Dr. Périer found at Chazay d'Azergues,‡‡ in the Rhône Department, near the cave still called the "Sarrazinière," a skull which, after its conformation, appeared to him as coming

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* Gillebert d'Hericourt, *Gazette Médicale de Lyons*, pp. 98 and 153, 1862.

† Fodéré, vol. i, p. 45.

‡ Reinaud, pp. 205-209, etc.

§ Hadry-Menos, "La Savoie depuis l'Annexation", *Revue des Deux Mondes*, Nov. 15, 1862.

‖ Gosse, *Bull. de la Soc. d'Anthrop.*, vol. ii, 1861. Caffe, *Journal des Connaissances Médicales*, p. 159, April 10, 1862.

¶ Fodéré, vol. i, p. 69; and vol. iv, *du Journal Complementaire du Dictionnaire des Sciences Médicales*.

** *Congrès Scientifique de France*, 22nd session, 1855, vol. i, p. 612; vol. ii, p. 482, communication of Messrs. Carmue and Aymard.

†† Dom. Johan. Mabillon, *Annales Ordinis Benedicti*, vol. ii, p. 89.

‡‡ *Bull. de la Soc. d'Anthrop. de Paris*, vol. vi, p. 224.

from those Saracens who built forts, now in ruins, at Château-Gaillard and at La Motte-Saracen between Ambronay and Varambron, in the "Ain" Department.*

North of Macon and south of Tournus, on both banks of the Saône, there are, on one side, the villages of Boz, Ozan, Arbigny, and Sermoyer, whose inhabitants call themselves Burkins; and on the other, the village of Uchizy, whose inhabitants go by the name of Chizerots. In contradiction to M. Reboud, M. Reinaud† seems to doubt their Saracen origin. In 1862 I went to Uchizy and Arbigny; several persons there told me themselves that they were of Arabian or Saracenic origin. In the midst of numerous individuals, having apparently no very distinct anthropological characters, some very black haired women differed from the inhabitants of the neighbourhood by their tall and slender figure, their elongated faces, without malar prominences, by their uniform and dark complexion, by their large eyes, long eye-lashes, black, thick and arched eye-brows, by their physiognomy, melancholy, yet regular and beautiful; for one of these young Chizerotes, when the French empress passed through Macon, had been appointed, as the most beautiful girl of the whole district, to offer a bouquet to her sovereign. That type seems more Arabian than Berberic.

Those Saracens, whose descendants are found on the banks of the Saône, according to Dom Jean Mabillon, destroyed Autun (*Augustodunum*), pulled down the abbey of Bèze (*monasterium Besuense*) near Dijon (Divis), attacked Sens (*Senones*) whence they were repulsed by Ebbon in A.D. 732, and lastly massacred St. Mellin and his monks in the monastery of Luxeuil: *Nec hujus cladis expers pagus Vesontionensis, ubi monasterio Luxioviotum proscrat abbas Mellinus numeroso cœtui monachorum, qui unà cum abbate cœsi sunt.*‡

Saracens, who devastated our provinces of the east, are also mentioned in *Li Romans di Garin le Loherain*. Not only is it

* Ribaud, "Sur l'Origine, les Mœurs, et les Usages de quelques communes du Dépertement de l'Ain, voisines de la Saône," *Mémoire de l'Acad. Celtique*, vol. v, p. 5, etc., 1810.

† *Ibid.*, p. 302.

‡ Vol. ii, pp. 88, 89, etc.

therein alluded to diverse engagements fought by Charles Martel, after which the pagans, expelled from Sens, fled as far as Troyes :—

"Vont s'eu fuiant Païen & Sarrasin,
Qui eschappa mont se tint à gari
Decì à Troies ne prenent oncques fin."*

But we read also of Hervis, duke of Metz, begging for protection from king Pépin in vain, against the Saracens besieging his fief and laying waste the valley of Metz :

"Qu'en vostre fief m'ont Sarrasins assis,
Le Val de Mez pechoie et mal mis.†

These easterns would appear to have dwelt some years in that region, for the slaughter of the monks of Luxeuil goes as far back as A.D. 732, according to Mabillon, and Pépin, who was petitioned by this duke of Metz, succeeded Charles Martel in A.D. 741 only.

M. de Saulcy, in his excavations at Crainvilliers, near Contrexeville, has found, in the midst of skulls and bones since forwarded to the Anthropological Gallery of the Paris Museum, a plate covered with Arabic characters (letters) upon which the name of Ali can be seen twice. These bones and this archæological specimen are in all likelihood the vestiges (signs) of a fight with these Saracens.‡

Moreover, in the tenth century, long after the Saracens' retreat, towards the south, the inhabitants of Verdun were still carrying on with them a strange commerce. The bishop of Crémone, Liutprand, being sent in A.D. 948 by the king of Italy, Béranger II, to the emperor of the East, Constantine VIII, has left records that amongst other presents which he was to offer, there were four *carsamatia*, or eunuchs, of whom the Verdun merchants were making a very lucrative trade with Spain.

"*Obtuli autem loricas optimas ix, . . . mancepia, quatuor carsamatia imperatori nominates omnibus preciosora. Carsamatum autem Græci vocant amputatis virilibus et virga puerum*

* *Li Romans di Garin le Loherain*, vol. i, Song i, § xiii, Paris, 1833.
† *Ibid.*, § xvii, p. 52.
‡ *Revue Archéologique*, nouvelle série, vol. viii, p. 351, Sept. 1863.

*eunuchum; quos Verdunenses mercatores ob immensum lucrum facere solent, et in Hispaniam ducere."**

As regards the Saracens of our east provinces, it is well to remark with Dom Mabillon,† Charles Lecointe,‡ and M. Reinaud,§ that the ancient historians and "romancers," have often confounded them with the Vandals. This confusion, doubtless, comes from the sojourn of these latter in Africa, whence, at a later period, the Saracens issued to pass into Spain and invaded our country. In the *Romans di Garin le Loherain* the Saracens are sometimes spoken of under the name "Wandres."|| Sometimes also the name of "Hongres" is given to them.¶ The "Hongres" were a different people, but pagans equally, who had, however, in the eyes of the Franks, adopted Christianity. They were doubtless the descendants of the "Huns," a colony of which had been established between La Nahe, the Rhine, and the Moselle, in a district called then "tractus Hunnorum," and now "Hundsruck"**; or from the Hungarians, issued from a mixture of Hungarees, Slavonians, and Magyars, which at a later period, from the beginning of the tenth century, invaded France several times,†† and encountered there the Saracens,‡‡ then masters of the Alps and the adjacent countries.

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* Liutprandi, *Historia*, vol. ii, cap. iii, 1723.

† *Loc. cit.*, p. 88.

‡ Carolus Lecointe, *Annales Ecclesiastici Francorum*, vol. iv, p. 728, 1670.

§ *Loc. cit.*, Introduction, pp. 34 to 38, and p. 31, *notes*.

|| *Ibid.*, § i, p. 1; and § ix, p. 22.

¶ *Ibid.*, § xvii, p. 51.

** Bouillet, *Dict. Hist. et Géog.*, Hundsruck.

†† Le Dussieux, *Essai Hist. sur les Invasions des Hongrois*, 1834.

‡‡ Reinaud, *loc. cit.*, p. 183.

XI.—*On the Ancient or Fossil Pottery found on the Shores of Ecuador.* By WILLIAM BOLLAERT, F.R.G.S.

I HAVE lately received a collection of very ancient and interesting Indian pottery from the north coasts of Ecuador. These specimens have been sent to me by my friend, James S. Wilson, Esq., an old Australian explorer, but now the Superintendent of the Ecuador Land Company's Settlement at Pailon of San Pedro, in Ecuador. I think these remains worthy of scientific notice, in consequence of their being the first specimens brought to Europe. They will give a good idea of the knowledge of the plastic art in that portion of the New World, long before its discovery by the Spaniards. I will now give extracts from Mr. Wilson's letters to me.

"*San Lorenzo, Dec.* 23, 1860.

"At various points of the coast of Esmeraldas may be observed banks of alluvial clay, standing six or eight feet above tide-level in the rivers and estuaries. While I was examining the Island of Santa Rosa, I visited a spot where Indian remains were said to exist. I found a quantity of broken pottery, of vessels, images, and other objects; and I was told that women frequented the place to wash for gold. I found the pottery in a stratum, one foot thick, of black vegetable mould, which was covered by a bed of yellowish clay six feet thick. On one of the islands of the Tola (1° 75′ N.) similar remains are found, in a like position. I have collected some of the figures for you. I suspected that the gold found there was wrought gold; and on inquiry was told that it was partly in scales, like spangles, with holes through them, so as to stitch the same to cloth.

"The place is a geological curiosity, the sea having risen slowly until it attained six feet above the surface, where these people had evidently lived for centuries; that the sea had again retreated, until the stratum had again nearly attained its former altitude. The sea is again encroaching slowly all along the coast."

Under date, Campana, July 25th, 1861, Mr. Wilson writes to me: "The pottery antiquities are sent to you. . . . I have purchased for the Ecuador Land Company a few small gold articles, found in one of those islands, called *Tolitas* (*tola* means a tomb); they are found in a stratum of ancient surface-earth, amongst broken pottery, and covered with an alluvial deposit, often six feet thick."

At the Great Exhibition of 1862, among other objects from Ecuador was the ancient pottery in question. The following is from a Report: "In the centre of the court is a case containing Indian antiquities, including an Inca sceptre, and the dried head of an Indian of the Jivaro tribe.* In the same case are gold ornaments from Molletura and Pailon. A few specimens of very rude ancient Indian pottery from Pailon." This is what I have called Fossil Pottery, sent to me by Mr. Wilson, and which I have deposited in the British Museum.

Description of the Pottery.—It appears to have been buried under the sea, then raised, probably by earthquake movements.

1. Large head and portion of bust, which may represent one of the monkey tribe, probably the *Horro*, said by the historian, Velasco, to be very large. (Mr. Bollaert has now a cranium of this animal in his possession.) This specimen, as well as the rest, is moulded of a sandy marl, and only sun-dried.
2. Portion of a human face, ear bored.
3. Small head, hollow,—a good specimen of art.
4. Small head of old man.
5, 6. Two other heads.
7. A small mask.
8. A grotesque head.
9, 10. Heads of animals, may be of the peccary.
11, 12. Sitting figures.
13, 14. Two flat pieces of pottery, studded on one side with small chips of siliceous crystals,†—used as a rasp or grater.
15. A foot.
16, 17. Two small vessels.
18 to 20. Portions of figures.

* See *Trans. Ethnol. Soc.* for description of, 1863, by W. Bollaert; also an account of a drawing in *Intellectual Observer*, March 1862. There is a specimen of a similar head now in the British Museum, and photographs at the Anthropological Society.

† See Markham "On Quartz-Cutting Implements of the Ancient Inhabitants of Chanduy, near Guayaquil," *Journal of the Anthropological Society*, vol. ii, p. lvii, 1864.

On some of the pottery, shells are seen firmly attached, probably of the *Ostrea* family; also others. Specimens of these were sent to Sir R. Murchison in 1866.

In June 1862, in *Proceedings of the Geographical Society*, Sir Roderick Murchison gave Mr. Wilson's letter to him of 25th April, 1862, on the subject of this ancient pottery and its geological position, when Sir Roderick made the following remarks:—"The discoveries he (Mr. Wilson) has made of the existence of the works of man, in a stratum of mould beneath the sea-level, and covered by several feet of clay,—the phenomenon being persistent for sixty miles,—are of the highest interest to physical geographers and geologists. These facts seem to demonstrate that, within the human period, the lands on the west coast of Equatorial America were depressed and submerged; and that after the accumulation of marine clays above the terrestrial relics, the whole coast was elevated to its present position."

Extract of letter, Quito, Jan. 3, 1865, from J. S. Wilson to W. Bollaert:—"I am anxious to perform another journey to the coast, that I may have an opportunity of making further observations on the strata containing relics of human art. . . . This extensive coast and river formation has afforded me grounds for much speculation, even before the discovery of those ancient relics, in France and elsewhere, was published by Sir C. Lyell. It is as old, geologically, as the drift strata of Europe in which those relics were found; and I believe it to be identical with that of Guayaquil, in which the bones of *Mastodon* are met with, and from this circumstance named "The Field of Giants." Under such considerations, we find the people of South America (or more properly Tropical America) more advanced in civilisation, during the Mastodon period, than those of Europe, indicated by those relics of pottery and wrought gold,—in the manufacture of the former they excelled the people of Ecuador of the present day, whether of American or European origin. What now becomes of the theories which represent America peopled from China, when at this period we find America possessed of a somewhat civilised people before China became a nation? indeed, I could produce arguments to

prove that the tide of migration flowed in the opposite direction."

In 1866, there was read at the Geological Society, "Geological Notes of the Pacific Coast of Ecuador, and on some Evidences of the Antiquity of Man in that region," by Mr. Wilson, abstract of which, with a section, is given in the November number of the *Proceedings* of the Society.*

* In the *Geological and Natural History Repertory*, vol. i (1865-7), p. 345, will be found Mr. Wilson's paper in full, with sections at the town of Esmeraldas, and of the point of Chancama.

XII.—*Is the Character of the Scotch the Expression of the Soil of Scotland?* By John Cleghorn, F.A.S.L.

Before I attempt to answer this question I shall explain how I have had my attention called to the subject, show you the steps through which I have been led to give my answer, and thus induce you, perhaps, to acquiesce in my conclusions.

About fifteen years ago I gave a lecture in Wick, "On the Surface Geology of Caithness," and in that lecture I said that our best cereals, our best cattle, and our best men and women, were raised on the boulder clay; and that where it was awanting, as on the top levels, there crops were scanty, the cattle poor, and the men and women miserable. Intelligent farmers who heard me, and who knew the county well, saw that what I said was true, and now, with us, good men and women are looked for on the boulder clay only. You may be very sure that since then I must often have turned the matter over in my mind, looking for "the reason why"; but I never was induced to give the subject much thought till about a year ago, when my friend, Dr. Arthur Mitchell, came to Wick. In a conversation I had with him, I said, "There surely must be a great difference between the east and west country Scotch"; but on his asking me why there must be this difference I found the answer I should give did not satisfy myself, and I was sure it would not satisfy so precise and correct a thinker as Dr. Mitchell. I therefore held my tongue, but ever since his question has haunted me. At that time I had a vague notion that the depressing east wind on the one side, and the soft western breezes on the other, might be agents sufficient to give distinctive features to those constantly subject to their influence; but a little reflection let me see that in Caithness the inhabitants of each of its parishes have distinctive features, and a distinctive dialect, as well as a parochial idiosyncrasy; that on the east coast of Scotland each county had its own dialect and type face; and that the same was true of the west coast populations, which would not

have been the case were the east and west winds the agents at work in producing these characteristics; in short, I found I was quite at sea on the subject.

The climate of the east and west coasts.—After Dr. Mitchell had left us I began to try and solve his question. I first ascertained what is known of the character of the east and west winds on both sides of the island. As to the east wind Dr. Mitchell pointed out to me that, being a cold and dry wind, it had great capacity for absorbing and retaining moisture, and that in its passage across the German ocean to us, it reached us not only dry, but a drying wind, therefore in its land journey westward it retained its character of dryness and coldness, and was there as much complained of as with us on the east coast.

Regarding the west wind, I found Ray, in his work *The Wisdom of God in the Creation*, quoted Cæsar as saying of the west wind, "Magnam partem omnis temporis in his locis flare consuevit"; it is wont to blow in these quarters a great part of the whole year, "which observation", says Ray, "holds true to this day, the wind lying in that quarter at least three-quarters of the whole year." And he says this appears from the trees, which grow on and near the sea shores all along the western coast of England, whose heads and boughs I have observed to run far to landward, but toward the sea to be snubbed by the winds, as if their boughs and leaves had been pared off on that side. Now I observe this snubbing off of the boughs of trees on their west sides, is as true at Wick as on the west coast of England. I saw, moreover, that the feal-dykes in the county had their south-west sides bare of vegetation compared to their north and east sides; and that all our old castles are in a more dilapidated state on their south and west than on their north and east sides. The trees, the feal-dykes, and the old castles of Caithness, seemed to me to proclaim that the west wind, soft although it be, yet from its constancy and its wetness is a more potent agent of change in the physical world than the east with all its bad name; and this character of it is borne out by what Dr. Mitchell says, viz., "We have in Scotland thrice as much wind from the south-west as we have from the north-east, and

it comes to us charged with moisture, which it readily parts with, so that it is a rainy wind. As to the temperature of the two sides the difference is not greater than that between two districts in several of the east counties; and the same is true of the rainfall on the two sides. I therefore concluded that the climatic condition of the east and west coasts are nearly one, or so alike as not to cause any great difference between the east and west country populations.

The Area of the Boulder-Clay.—So far as we Scotch were concerned, then, I gave up climate as a race producer. At this stage of my investigations what I had said fifteen years before, of the relation between the boulder clay and the organisms on it, recurred to me, and I asked myself did the same relations hold true over wider areas than I had yet examined, and this is what I found. "The distribution of these drift deposits in Scotland," says Professor Nicol, speaking of the boulder clay, "is very distinct. It divides the country into two strongly contrasted regions—an eastern and a western. Their boundary is marked generally by a line which, beginning on the Clyde near Dumbarton, runs north-east by Callander and Crieff and thence round by the head waters of the Dee and Spey, along Monag-Leadh mountains to near Inverness. Thence it passes round the Beauly, Cromarty, and Dornoch firths, by the western declivities of Ben-Wyvis and the foot of Loch Shin, onwards to the north coast. Each of the great regions separated by this line has its own marked and peculiar character. The eastern all over the low grounds and high up over the mountains, is covered with a thick mass of boulder clay and upper stratified drift. In the western the boulder clay is scarcely known; the rocks are bare and exposed, or in the valleys covered with a thin coat of local detritus, chiefly water-worn sands, or gravels. The east is a land of enormous depositions, the west one of equal waste and transport."

Dr. Samuel Johnson said of the west highlands: "Your country consists of two things, stone and water. There is, indeed, a little earth above the stone in some places, but very little; and the stone is always appearing; it is like a man in rags—the naked skin is still peeping out." Having thus found

the area of the boulder clay in Scotland we shall now consider the organisms on it and off it.

The Organisms on and off the Boulder Clay.—"The west," says Professor Nicol, "is a land of naked rocks, lochs, and black moors. The east is a land of noble trees and fertile fields, of carses waving with crops of golden corn." Is this description borne out by the returns of the crops, &c., &c., on the two sides? I think it is. I have taken the Board of Trade returns for 1866, relating to the population, area, acreage of crops, corn crops, and the number of cattle and sheep in the following counties on the east and west of Scotland, dividing the country as near as I can to harmonise with the line indicated by Professor Nicol. The counties on the east are Aberdeen, Banff, Berwick, Caithness, Clackmannan, Edinburgh, Elgin or Moray, Fife, Forfar, Haddington, Kincardine, Kinross, Linlithgow, Nairn, Peebles, Perth, and Selkirk. On the west—Argyle, Ayr, Bute, Dumbarton, Inverness, Lanark, Renfrew, Ross and Cromarty, Stirling, and Sutherland.

East—population, 1,330,989; area, 6,868,348; under crop, 2,328,212; under corn, 872,141; number of cattle, 440,476; number of sheep, 1,802,248. West—population, 1,448,653; area, 10,102,637; under crop, 1,038,636; under corn, 284,260; number of cattle, 353,253; number of sheep, 2,304,046.

Of the comparative value of the corn, the cattle, and the sheep of the two sides these returns tell us nothing; but knowing that the western slopes of boulder clay districts in Caithness afford inferior corn to north and east exposures, and that farm servants in Ross-shire often bargain to be supplied with Caithness grown oatmeal, rather than that grown in their own county, I judge that west country corn must indeed be poor stuff. The cattle, too, of the west are, I believe, unfit for the table till fattened on eastern pastures; and the sheep are, I fancy, like the cattle in this respect, for a Caithness flockmaster tells me that he has two hirsels, one on the south-west and the other on the north and east of a mountain range in Caithness, and that he can command two shillings ahead more for the sheep reared on the north and east than he can get for those on the south-west of his ground. The difference in value

between east and west country Scotch sheep must surely be very striking. But when we know that Aberdeenshire sends more beef and mutton to the London market than all Scotland, we must infer not only that Aberdeenshire must be a very remarkable county, but that the difference in value in the cattle and sheep of the east and west must be great indeed, seeing the west sends none there.

Let us now look at the men of the east and west.—On the western side of the boundary line of these strongly contrasted regions the Gaelic is the prevailing language; on the other side it is the Saxon. Out of the eastern counties our most distinguished scholars have arisen. Aberdeenshire alone has produced a greater number of *senior wranglers* than all the west of Scotland. On the east we have three universities, our religious revolutions have had their rise there; and there is an individualism in the east countryman that seems wanting in him of the west. The west men move in masses; "shoulder to shoulder" is their motto. At the period of the Reformation, in the choice they made, they seem to have been governed by the leanings of their chief, and at the disruption they moved with the minister. The clashing of minds on religion is little heard on the west. The religion of the west may be shortly characterised as priest-worship; that of the east as self-worship. On the west there is one university; on the west the men are more remarkable as warriors than scholars. As evincing that the reasoning faculties are less in use on the west than on the east coast a little attention to the Registrar General's returns of births and marriages will, I think, demonstrate. I have taken the return for the year 1864, and divided the country as before, and found the births, the illegitimate births, and marriages (the illegitimate percentage given is the mean for the ten years 1855-1864), and this is what is found:—

	Births.	Ill. per cent. for 10 years.	Marriages.	Deaths.	Respiratory Deaths.	Zymotic Deaths.
East	47,331	10 per cent.	9,767	30,360	3,749	7,749
West	56,517	6 per cent.	11,388	39,055	5,746	10,508

The birthrate of the west is greatly in excess of the east rate, through the operation of this law, made known by Doubleday: "Nature only causes an increased productiveness when species

is put in danger, and in the ratio of the danger." "This law," says Doubleday, "runs through the vegetable and animal creation. The plant or animal that is starved as to natural aliment, is prolific in proportion. Hence all rich aristocracies decrease, all poor communities increase. Nature, by this beneficent law, causes luxury to be barren, to stop the progress of disease, and poverty to be prolific, to save the species from extinction." In a comparison of the English and Scotch birthrates, we see the same truths taught. There can be no doubt that the English dietary is, in quantity and quality, far higher than the Scotch; and the Registrar-General tells us that in Scotland 348 wives gave birth to 100 children, while it requires 386 wives in England to produce 100 children in the year. The low illegitimate rate of the west, apparently so indicative of thought, may be thus explained. The dissuasives from illegitimacy are the same on the east that they are on the west; it follows, then, that on the east the promptings must be stronger than the dissuasives, while on the west the dissuasives must outweigh the promptings; therefore, the *vis vitæ* must be less energetic on the west than it is on the east. That this must be the cause of the low illegitimate rate of the west is what the table, showing the produce of the west, would imply; but it is put beyond a doubt by these facts, that the bastardy rate of the east is highest in the counties where the cereals and cattle are in the highest perfection, and the higher faculties of man best developed. The highest illegitimate rate on the east, then, evinces in its population *generally* an amount of restraint so great as can only exist among men and women of a high order. This sentiment is well expressed by Hume when portraying Queen Elizabeth's character. He says: "In her family, in her court, in her kingdom, she remained equally mistress. The force of the tender passion was great over her, but the force of her mind was still superior; and the combat which her victory cost her serves only to display the visible firmness of her resolution and the loftiness of her ambitious sentiments." The evils of low nutrition, or in other words, the want of soil, is further shown in the high marriage rate of the west. Notwithstanding their want of soil, their low dietary, and the consequent

apathy there must be in their men and women, their slight promptings to marriage are at once gratified, heedless of all the evils improvident marriages necessarily entail. But the chronic starvation of the west is put beyond doubt by the high deathrate of the west. Had the west rate been that of the east, the deaths would have been 34,133, and not 39,055, as we find they are; thus, nearly five thousand fall a prey to destitution annually. That the excess, at least, arises from want of nutriment, appears from these facts: That the deaths of the west from affections of the respiratory organs were nearly 1,000 in excess of the east rate, and of children more than 2,000 died in excess of the east from zymotic diseases. "Consumption," says Dr. Hewitt, "in its many forms and disguises, appears to be essentially connected with want of food."

We see that this diversity cannot be attributed to climate, nor can we, with more probability, impute it to the boulder clay, for the boulder clay is seldom that in which the plough works,—is not that which affords us food, at least in Caithness. I judge then that the boulder clay cannot affect the condition of the plants or animals on it. But to what cause are we to attribute the strongly contrasted regions pointed out by Professor Nicol? How came it that the boulder clay fills all the valleys on the eastern, and is awanting on the western watershed? By finding that we may find a way out of the difficulties that meet us when we would investigate the distinctions in the form and in the customs that pervade the inhabitants. To what agent are we to attribute "the upper stratified drift" that covers the boulder clay, and what is its character? These are questions we shall now try to answer, and having done that we shall look at man's relation to the soil.

Since the above was written I learn from an intelligent provision merchant in Wick, that no two parishes in Caithness afford eggs of similar quality; that he can tell from the taste of the egg the district it was raised on; that the same is true of the fowls, and more decidedly so of the pork and the butter; and that the meal of some farms had in it all those qualities that allayed hunger, that built up the eater, in greater proportion than the meal of other farms. We have what is called

weak meal and strong meal. This variety, I judge, must be owing to their chemical constituents being different, and that this variation must be owing to variety in the soils on which they were raised.

If this be true of the food out of which man is elaborated, then the varieties of the men in Caithness are, I fancy, to some extent explained. I was strengthened in this opinion on learning the general belief, that a boll of Murkle oatmeal is held to be worth a boll and a half of any other meal raised in the county. Overlooking the virtues of their meal, Murkle masons will persist in making Murkle doors no wider than doors are generally, forgetting that Murkle men and women are of a very different build, have a breadth far from common, and often stick in their doors; hence the phrase, "the stick-doors of Murkle." Murkle is in the parish of Olrig; but Dunnet, its neighbour, is also famous for good meal, good potatoes, butter, pork, and other good things. Dunnet, perhaps, does not turn out such bulky men and women as Olrig; but I know it turns out intelligent and much-prized maidservants, a greater number of ship-captains, and more master masons than any other parish in the county; and in its parish minister—a Dunnet man—it has the most popular parish minister in the county.

On the right track.—From what has thus far been made apparent, a further pursuit of our inquiry, on the same track we have marked out, seems to me to be fraught with important results. That this course has not hitherto been pursued is, perhaps, the true cause that anthropology is so chaotic. The error hitherto appears to me to be that which stood in the path of geological progress; viz., a prevailing persuasion that the ancient and existing causes of change were different, both as regards their nature and energy. Sir Charles Lyell says, "The first observers conceived the monuments, which the geologist endeavours to decipher, to relate to an original state of the earth; or to a period when there were causes in activity distinct in kind and degree from those now constituting the economy of nature. These views were gradually modified, and some of them entirely abandoned, in proportion as observations were multiplied, and the signs of former mutations more skil-

fully interpreted. Many appearances—which had for a long time been regarded as indicating mysterious and extraordinary agency—were finally recognised as the necessary result of the laws now governing the material world; and the discovery of this unlooked-for conformity has at length induced some philosophers to infer that, during the ages contemplated in geology, there has never been any interruption to the agency of the same uniform laws of change. The same assemblage of general causes, they conceive, may have been sufficient to produce, by their various combinations, the endless diversity of effects of which the shell of the earth has preserved the memorials; and consistently with these principles, the recurrence of analogous changes is expected by them in time to come."

This extract, to my mind, strikingly depicts the state we are now in, and the course we must follow, if we would read man aright. We have viewed man through a wrong medium. Let us, therefore, forget for a little all we have heard of the history of the men of the two sides; look at them as they are, and some of the agents of change now at work, and see if they explain each other.

So far as we have got, it appears that no two districts can be more diverse in soils than our eastern and western watersheds; while as regards climate, no two can be more alike. On the west, the grass is scant, and the cattle stunted; and being without soil fitted to grow corn, man's higher faculties seem to me as in abeyance, or dwarfed by penury.

"His knowledge measur'd to his state and place."

Is diversity in the physical and social features of man necessary to the health of the Order *Bimana?* and is diversity of soil the means for its attainment? It looks very like it. If diversity of character in man be for the health of the Order, then there must be a natural law determining this diversity; and as I have found a law determining diversity in soil, I shall show you that there is a harmony between man and the soil so intimate that, having found the soil, you can tell the type of man it carries. I shall now, therefore, point out this law, how it now works, and how we have evidence that it has worked in the past as it does at present.

In the *North British Review* for February 1852, there is a paper on the "Geology of the Surface and Agriculture," where, I believe, for the first time, public attention was called to the fact that the superficial deposits were excluded from geological maps; and that it was the fashion among those who undertook to teach geology, in its application to agriculture, to tell the farmers that the nature of the soil being given on one part of a geological formation, it is known for the whole; that the rock below them, which is nearest the surface, should be assumed as the surface. This geological fiction has still a strong hold on the public mind; but the intelligent farmer knows that this is either not true, or a very rude approximation to the truth; and that within very small areas, on the same field, many varieties of soil occur of very different values, without any corresponding variation in the mineral character of the rock on which they rest.

The law that has determined this variety of soil, I think, I discovered in 1857; and at the anniversary meeting of the Royal Geographical Society of that year, Sir R. I. Murchison made this law known to geographers. The law is this,—the prevailing wind here and over the northern hemisphere, the south-west, wears the headlands into precipices, which sends back the *débris* by a counter or reflux current, which necessarily tends to shoal up the opposite side of the bay, firth, or sea. This law, so simple and so universal, has been recognised as true by eminent geologists and geographers, and by marine engineers of the highest standing. The wonder is it should till now have escaped detection. This law works in China and Japan as it does in Wick bay; the law of forces here is the law there. The waves lay down the materials committed to them, by dynamic law, with a discrimination above all human nicety of manipulation; every particle is scrutinised, and has its fixed place in our bays, firths, and seas,—the mud, the sand, and the gravel,—and these mechanically and chemically diversified in endless variety. The natural laws are universal, invariable, and unbending. That we may have a proper appreciation of the majesty of this law, and the magnificence of its operations, let us look for a little at its working on the east and west coasts of Britain.

"The east and west coasts of Britain have," says Professor Nicol, "features very distinct. On the east, long lines of rugged cliffs, with scarce a break or a bay in which the smallest vessel can seek shelter from the north-east storms. On the west, innumerable sea-lochs running far up among their guardian mountains, with deep water to their extremities. Even the wreck-chart tells the same story; so free of shipwrecks on the west,—so bleak, with signs of disaster, on the east, where, from the Orkneys to the Tweed or Thames, no shelter opens to the storm-tost sailor, save the Moray Firth or the neighbouring Forth. But the distinction ends not on the shore. Beyond it there are, on the west, islands numberless.

"On the iron-bound eastern coast our progress is arrested by no Islay or Jura, no Mull or Skye, where nature has built shrines which man has yet failed to desecrate and destroy. There, from St. Abb's Head to John O'Groats, where we pass the Bass Rock and the May, no rock or islet meets our view; and even below the water the same difference prevails. From the Moray Firth across to Norway and south of the English Channel, the North Sea has no soundings deeper than Loch Ness. Every where mud banks and shoals, so shallow, that on the German side the sailor fears his ship may ground in the mud before he comes in sight of land. How different on the west coast. There you may leap from land into twenty fathoms of water; even within the islands one hundred to one hundred and twenty fathoms are common; and only a few miles out the sounding line passes first the one hundred fathom then the two hundred fathom line, beyond which to the American shores the water is measured not by hundreds but by thousands of feet." This is Professor Nicol's portraiture of our east and west coasts, and very true and very graphic it is; but the learned Professor, when he essays to explain the agency that effected the diversity of contour in the two sides, has been any thing but fortunate. "Physical diversities so great," says the Professor, "imply a very diverse physical history. The one region, the west, is evidently a half-submerged mountain-land; the other, the east, an emerged sea-bottom. Anciently, for a long period, the west has been a broad, lofty mountain chain; the east, on the other

hand, a wide, mud-filled sea-bottom, with shipwrecks floating and straining in its shallow waters,—the one side of the island has arisen, the other has gone down." Such a jump out of the difficulty, I respectfully submit, cannot be accepted. The professor cuts, not patiently unties, the knot, as is required. He runs counter to the teachings of modern geology, which has discarded violence, fictions, and miracles to help us out of our difficulties. The professor must be told that the east and west coasts of our island have their type in every bay and firth on the coast,—on the coasts of every island and continent, and that it never will do to bring an earthquake to deepen the west and raise the east sides of all of them. The professor did not know that the prevalent wave-producing wind wears the headlands into precipices, which send back the *débris* by a counter or reflux current, which necessarily tends to shoal up the opposite side of the bay, firth, or sea. Had he known this law, we would not have been told that "the one side of our island has arisen, and the other gone down."

Our prevalent wave-producing wind, the south-west, is pulling to pieces the western shores of continental Europe, and laying the *débris* down on our eastern shores. On our eastern shores, our law is a builder; on the west it is an excavator. Through the operation of our law, Heligoland is melting away, and the Dutch with difficulty retain Holland. The western side of Britain, like that of western Europe, is the losing side. Take the map, and see the soft and swelling outline of our eastern shore,—youth is in every lineament; while the west coast has every mark of age and decay imprinted on it,—it is angular, wrinkled, and furrowed. This growing on the east side, and the decay and transport that is going on on the other, is strikingly shown in the engineering difficulties experienced to keep the Tyne open and deepened; while on the Clyde and the Mersey the same ends have been gained with an ease which our law, and no other, can satisfactorily explain.

We can see now why the boulder-clay fills all the valleys on the east side, and is wanting on the west side,—how it comes about that we have on the east "an upper stratified drift," the soil that gives us food; and why it is wanting on the west, and

there only, as Professor Nicol says, "a thin coat of local *detritus*, chiefly water-worn gravels," or, as Dr. Johnson said, "stone and water, with a little earth above the stones in some places." We see, too, why the west is a land of waste and transport; and now we have seen on the wide area—the east and west of Scotland—the same correspondence between the soil and man, that I saw on the narrow area of Caithness.

Our law has left its trail on the surface of this country, and of all others, in a way we have not yet looked at. The north-east side of the floor of all our valleys is the low side, for to that side all our rivers tend; they hug their north-eastern banks. The north side of all our valleys, too, is, in an agricultural point of view, of inferior value to the opposite side, from the continuance, during a very long period, of the same hydrodynamic force that broke down and deepened the north-east sides of our bays and firths. The north and south sides of the Moray firth, and the Firth of Forth, and of all bays and seas, tell this story; while the diversity of soil within small areas, on the same farm and on the same field, point out our law as the agent that effected the diversity.

Epitome and Conclusion.—We have found a diversity in the men of the two sides of Scotland, and that this diversity corresponds with the diverse character in the soils of the east and the west sides. We have found, too, a natural law that determines diversity in soils, and diversity in the properties of the food the soils afford. I am surely, then, justified in inferring that the east and west countrymen are the expression of the soil, in the same sense that the flora and the fauna of the two sides are its expression.

Surely, then, it must be conceded that the character of the Scotch is the expression of the soil of Scotland. If this be granted, then it follows that his language is of the soil; and so must his religion be. Gaelic, surely, is of the soil; for I see it is confined to the sterile districts, and seems to be retained there, because the condition of the poor districts, as food producers, remains unaltered. In Caithness, we have five parishes wholly English speaking,—Wick, Canisbay, Dunnet, Olrig, and Bower, and these on the east and north of the

county; the other five are semi-Gaelic. To account for this difference, the commonly assigned cause is, that the English speaking parishes were colonised by Scandinavians. But the same people conquered and colonised the west country as well as the east; while their descendants speak Gaelic on the west and English on the east,—languages not spoken by the invaders. In the north, the Gaelic begins where the corn-bearing soil ends; and on the south-west, the same holds true. This linguistic difference in the two sides is not more diverse than their food-giving capacity; and seeing we have in Caithness—in the English speaking parishes—dialectic varieties, and that on soil so nearly homogeneous as ours is, we surely ought to infer that where the greatest diversity exists in soils, there we ought to find the greatest diversity in language.

I have said that the religion of the west may be characterised as priest-worship; that of the east, as self-worship. The want of corn on the west, "that strengtheneth man's heart," engenders the massing propensity,—the shoulder to shoulder principle; paucity of food, low diet, weakens the whole man; all his faculties are absorbed in food-getting; the struggle for existence being great, he depends on the priest for his religion, leaves that to him, takes what he has to give, and asks no questions. The east man, having the corn and something more, is filled and is strong; and he says to the priest, stand aside, I can do your work myself,—I do not require your aid. The west man's religion, although called Protestant, is essentially Popish, and Popery is the religion of the poorer countries of Europe,—poor in soil, I mean, and in the Murkle sense of poor soil.

It seems a just inference, from the working of our law of winds and currents, that Ireland must be an exaggeration of our western watershed; and that most of her ills must be attributed to Irishmen's ignorance of our law. Had they known the poverty of their soil they would, as George Combe would have told them, have been able to ascertain the extent to which it is possible for man to place himself, in accordance with the physical law that produced the sterility, so as to reap advantage from it; and also to determine how far the sufferings which he

XIV.—*On the Land Dayas of Upper Saráwak, Seutah, Lihoy, Letung, and Quoss.* By Edward P. Houghton, M.D., F.A.S.L., Resident Officer, Saráwak Government.

The average height of the people is 5 ft. 2 in., 4 ft. 6 in. being considered short, and 5 ft. 6 in. tall. The complexion is yellowish brown, the eyes and hair black; the latter is coarse, and is generally worn long—in some few cases it is inclined to curl. The shape of the head is round, a little elongated on the top; the face is broad; the eyes large; the nose a little pressed in on the bridge and wide at the bottom; the nostrils are large, the lips thick, and the teeth rather projecting. Puberty takes place, as far as I have been able to ascertain, at the age of from twelve to fourteen years, though the people do not marry young. Births of more than one child are not common. In general there are more than two children in a family; on an average there are four, very seldom only one child. There are more males than females among adults, but in general the proportion is about equal. There are families with two, three, four boys, but also others with the same number of girls, or mixed. Women continue to bear children to about the age of forty. This is, however, a matter not very easy to determine with certainty, as before the Europeans arrived in the country the people had no mode of calculating their years. Even now most of them do not know their ages, but guess only, and sometimes quite at random. You might hear people answer the question, How old they are? with eighty, one hundred, or two hundred, who perhaps are not yet half that time. Another reason for dividing their answers, with respect to age, by two, is that they count a year only six months—*i.e.*, from one rice harvest to the other. The people in general attain a pretty good age, the greater part up to sixty or seventy. The oldest man here, and, in fact, of the whole Scutah tribe, is a (formerly heathen) priest or menang, about ninety-five to one hundred years of age, with grey hair. He has lately become a

Christian. He has a large family, all sons, some of whom are also Christians. His first wife, about seventy years old, is still alive. Both are still able to move about, talk cheerfully, and enjoy their food. The old man is suffering from loss of sight.

Mothers suckle their children very long. There are cases where children suck till they are three to five years of age. The women have in general an abundance of milk, and are very strong. The menstrual period lasts about four days. The time of uterogestation is the same as with Europeans. Miscarriages and premature delivery are not rare occurrences. The prevailing forms of disease are—intermittent fever, otitis, ichthyosis, scrofula, catarrhal opthalmia, diarrhœa, elephantiasis, leprosy, furunculi and anthrax, enlarged spleen with ascites, cholera and smallpox, indolent ulcers. The people also suffer very much from entozoa, the lumbrici generally, very seldom thread-worms. Syphilis and gonorrhœa are never known. Among those Dayas who do not come in contact with Malays, the treatment of the sick is entirely in the hands of the manangs. Those who have had intercourse with Malays often try their remedies, after the attempts of their own priests have failed to produce a cure. All remedies are external, either rubbing, or washing, or sprinkling. I have never seen or known of a Daya doctor giving a drug or any internal medicine, or interfering with the diet. If one excepts, therefore, such few cases where rubbing or washing would rationally be of any use, the whole medical treatment of the Dayas rests on their heathen system of superstition, in some cases perhaps approaching sympathetic cures, professing to transplant sickness. They believe that in sickness the human soul goes out of its body, is perhaps carried away by evil spirits, and has to be brought back again to its proper dwelling-place. This is done according to certain established rules and ceremonies. In all of these the blood of animals, either pigs or fowls, is used as a kind of sacrificial atonement or purification. They have a number of *fetiches*, magic stones, which are said to possess supernatural powers. They relate that such stones are given by spirits to the priests, their places indicated in dreams, or they have fallen from heaven in former times. They have

several large ones with distinct names, "Le Bandos, "Le Gunas," "Le Ruyare," &c., at different Daya villages. On certain days they are carried about in procession, and festivals are held at their places. Such stones—"guna," as they are called—have particular houses built, and a Daya, who is paid by the village, is appointed to watch over them. In cases of sickness a certain kind of altar is erected near the sick person's head, offerings are put on it, and a single gong beaten all the while. Then the priests sprinkle the sick man with blood, and make certain marks on him, as well as on his relations. No inmate of the house is allowed to leave it for two or three days; no stranger may enter. They also bathe the sick with cocoa-nut water mixed with ginger and a yellow root. Often also they use spittle (saliva mixed in their mouths with red sirih), and spit on his face, neck, and other parts of his body. Then there are three or four men and women appointed to go by night with torches and gongs beating in the jungle, carrying with them rings of beads washed in the blood, and magic stones, in order to seek for the place where the departed soul of the sick may have run to, and bring it back to him, after which crowning feat he is said to recover. Soon after the birth of a child they have a similar ceremony of, so to say, initiation, or bringing the new child under the dominion of their gods, by washing and sprinkling child and parents with blood and cocoa-nut water, to drive away the evil spirits, and to secure to the new-comer the influence of their magic incantations.

If I may be allowed to infer one remark from these short statements, it is this: You see here, in the simple Land Dayas of Borneo, another most striking proof we, in the full light and benefit of Christian civilization, are often apt to forget—that fallen human nature, lying under the fear of a supernatural world unknown, seeks for ways and means to bring about a reconciliation with a high and pure Being, and to draw down blessings upon the dark state of misery and trouble.

The prevailing food is rice, boiled in bamboos, with vegetables, cribung, yams, cucumbers, lotus, etc. They are fond of pork and fowls. Often they catch in traps in the jungle wild

pigs and wild deer, which they salt and keep in jars. They also catch fish now and then, but in general eat salt fish as the cheapest and most easily-procurable condiments with their rice. Their cooking utensils are bamboos, which they find in abundance in the jungle, use two or three times, and then throw away. Besides these they use iron saucepans and pots to cook rice, vegetables, meat, etc. The bamboos are also used to fetch water. Other articles of food are snails, prawns, birds (if they can be got), and certain kinds of monkey. It is said that some of the natives also eat snakes, but this is a matter I will not vouch for. The Dayas make three chief meals a day, at seven or eight in the morning, at twelve, and at five or six in the evening. This they do when they are at home during their rest time. When they work hard in their farms they often dispense with one or two of these meals, also when travelling. They are very strong and robust people, and able to bear a long abstinence (some two or three days). Their life is a very hard-working one. Several months in the year they live entirely away from the village in houses built on the farms in the jungle, preparing the ground, sowing, weeding, and harvesting. They are able to carry very heavy loads on their backs. Men, women, and children work on the farms. The women are not treated with any distinction with regard to the farm-work.

The dressing of children, as well as of grown-up people, is very plain. A cloth round the waist in the case of the males, and a short petticoat in the case of the females, is all their dress. If it is very wet and cool weather, they use the rind of a tree as a kind of blanket in which to wrap children. The cradle consists of the hollowed trunk of a tree, suspended by strings from the ceiling. There are no circumstances connected with the dressing or cradling of children tending in any way to modify the shape of the body. Besides the short petticoat mentioned above, which is fastened round the loins by a brass wire girdle, the females wear a number of brass rings; on their wrists and upper part of the arms a white porcelain ring as ornament. In their ears they have ear-rings, or, if too poor, flowers and leaves of certain trees. The flowers are also worn in the hair. At festivals other and better petticoats, with little bells fastened

on them, are used; also a kind of head-dress, something like a sugar-loaf, and red jackets. A most necessary implement and companion of each Daya is his sirih-case, with leaves, chalk and tobacco, and gambir, as also his large knife.

The houses are built very plainly, part of bilion or ironwood, a raised platform of bamboos crossed, walls and roof of leaves of the sago palm, very durable and water-tight. Each family occupies one large room with a verandah. At the entrance of the room there is a hearth, made of earth and stones: on this they cook. Of course, the whole room looks black from smoke, which has no other escape than the door and one large window. This latter is merely a large hole left in the roof, and in rain must be shut with a shutter made of palm-leaves. The room is lighted by the fire from the hearth, and by a little torch made from the gum of a tree, put into bamboos, and used as oil. The sleeping-place is before the fire, on mats spread out at night; pillows stuffed with grass, etc., are made use of, and coverings made of the rinds of certain trees.

There are no monuments in the shape of buildings, but in language they have some remnants of old songs and stories, which have been handed down by oral tradition. Other tribes of Dayas more inland are said to possess very old valuable jars; but in the parts of the country I am acquainted with, I have not heard of the existence of any antiquities, unless the big guna, a stone of man's length (most likely an aerolith), called Le Kuyan, which is kept in a house at Seun, be considered as such.

The dead are buried here in a hill outside the village. In the other villages they are *burnt* in the jungle; and this custom, as well as a certain *Tinasti* the people invoke in all the ceremonies, leads to the conclusion that an emigration of later date has supplanted partly the old Daya fetishism. With the dead offerings are made and animals burnt,—pigs in the case of the richer people, and fowls, or a part of a fowl only, in that of the poorer.

The Dayas believe very dimly in a future life. They say the soul is changed into a spirit, which hovers about the hills and places in the jungle. These spirits, which are called "Minos,"

are objects of fear and superstition. Customs are observed on account of them.

There are no particular ceremonies at marriages. The relatives (or parents, if alive) of bride and bridegroom form certain agreements with each other about settling property, etc., which chiefly consists in jars and gongs—clothes and gold, if rich. The bride follows the bridegroom to his house or his parents', and is considered a member of his family. Polygamy is not practised by the Land Dayas here. Divorce is very frequent, owing to the great extent of adultery, and thus a criminal practice of intermarrying exists, which contributes very much to the debilitating of the tribes. Widows are in general treated very well, as also the sick and aged.

The domestic animals are pigs, fowls, cats (short-tailed), and dogs. They are of the common kinds, indigenous here.

Each village has at its head a man appointed by the Government of the Rajah of Saráwak, chosen by the people, called "Ovay Kaya." If a village has less than one hundred and fifty inhabitants it has only a "Penyara." He, with a number of old people elected by the community, called elders, directs and governs all the affairs of the village, under sanction of the Government. All the bachelors of a village, from the age of twelve upwards, live together in a round house built separately from the other houses. In this house also the heads of enemies taken formerly in war are preserved. Head-hunting is, however, now forbidden, thanks to the Rajah's Government, and head-festivals are therefore out of use.

XV.—*Habits and Manners of Marvar Tribes of India.* By John Shortt, M.D., M.R.C.P.L., F.A.S.L., F.L.S., etc., General Superintendent of Vaccination, Madras.

In the district of Madura there are two large zemindaries, and these were at one time united, and under the government of one *Kelaven Saithoo Pathier*. The legend as regards these estates runs as follows:—

About one hundred and forty years ago, a few miles from the present Zemindary (Shevagunga) there existed a village named Nalcottai, subject to the control of one Shasivarna Taver, a Polgar, who was married to an illegitimate daughter of Kelaven Saithoo Pathier, and whose name was *Akilanda Espari Natchiar*. On the death of Kelaven Saithoo Pathier, of Ramnad, the succession was disputed between his illegitimate son and son-in-law, but the latter obtaining the assistance of the Rajah of Tanjore, usurped the kingdom of Ramnad; the illegitimate son consequently sought the shelter of the Nalcottai Polgar for some length of time; but when Kelaven Sathoo Pathier's son-in-law, the usurper, heard of the protection that had been given his brother-in-law by the Polgar of Nalcottai, he sent a small force, and drove him out of his estates, and destroyed his villages; in consequence of which *Shasivarna Taver* and the illegitimate son of Kelaven Saithoo Pathier sought shelter at Tanjore, and there led a life of poverty, until an opportunity offered itself, when Shasivarna Taver distinguished himself in a personal combat with a royal tiger, for which he obtained the favour of the Rajah of that district, who on inquiry learned his history and subsequent troubles, upon which he gave him an armed force to retake his possessions, Shasivarna himself leading the force on to Ramnad. He stormed the place, killed the usurper, and placed his friend, the illegitimate son-in-law of Kelaven Saithoo Pathier on the throne. In consideration of these services, the Saithoo Pathier (the title is in use among the Rajahs of Ramnad, and

means Lord of the Causeway) directed his kingdom to be divided into five portions, three of which he retained himself, and which at present form the zemindaree of Ramnad, and the remaining two divisions he bestowed on Shasivarna Taver, the Polgar of *Nalcottai*. The subsequent Rajahs and Ranees of Shevagunga are the descendants of the said Shasivarna Taver, the Polgar of Nalcottai. Owing to the division of the zemindaree into two portions, Ramnad was called Pareeyavadi, and Shevagunga Sheenavadi.

It is said that whilst the country was being divided, Shasivarna bribed the accountants and others, and selected for himself the best portion, more especially that part watered by the river Vigay.

The following fable is connected with the origin of the town of Shevagunga itself, which is situated in lat. 9° 51′, long. 78° 33′, and is twenty-six miles distant from Madura, east by south. It would appear that when Shasivarna Taver was simply the Polgar of Nalcottai, and was out on a hunting excursion, and being overcome with thirst, he, after some search, came upon a small spring of water. Here he met a rishi (Hindoo monk), who foretold that he would become the possessor of that territory. Shasivarna Taver, in return, promised that, should the rishi's prediction be fulfilled, he would convert the spring into a large tank, and call its waters the Gunga, or River of Sheva, and raise a town around it. Subsequent events having fulfilled the prophecy, Shasivarna Taver, with rigid punctuality, carried out his promise in constructing a large *theppa colum*, or square stone-faced tank, leading by steps to the water, on four sides, and here he constructed also the town, and made it his capital, calling it Shevagunga; and for upwards of a century this place has been the residence of the ruling Zemindars, Shasivarna Taver being the first Zemindar,

The estate of Shevagunga comprises about 1,000 square miles in extent, with upwards of 1,000 villages and hamlets. The population is said to comprise 396,116 individuals.

The revenue realised by this estate is estimated at between six and seven lacs of rupees per annum, and the Government peiscush (tribute), which amounts to about 222,000 rupees, is paid out of the above revenue.

This zemindaree continued in regular hereditary succession down to *Veloo Natchiar,* during whose government her Prime Minister, the famous Parryamaruthoo, and his brother Chima-maruthoo, *Servacarus* (warriors) by caste, usurped her authority, and ruled the country, in their own persons, in reality. Their rule, although despotic, did a vast deal of good to the zemindaree itself; and their efforts to extinguish the hereditary succession were ceaseless, and with this object they murdered all the members of the Shasivarna Taver family, with the exception of two brothers, who fled into the country. They were named Gowry Oyya or Woodia Taver, the eldest, and Gowry Vailaba Taver, the youngest. The latter, however, was captured and put in chains, and kept in the jungles of Kaliar* Kovil†, from whence he made his escape to Arthangee, a village in the kingdom of Tanjore, with the connivance and assistance of a servant-girl of the Kuliar caste, employed in the Shevagunga palace. He nevertheless underwent great hardships, being constantly persecuted by the brothers Muradoo, and several times narrowly escaped being murdered.

About this time the famous *Oomien,*‡ Polgar of Pongallum Covelly, rebelled against the late East India Company, and he was assisted with arms and ammunition by the two brothers, Chinna and Parria Murathoo. Finally they themselves raised the standard of rebellion. The Mahratta invasion in Southern India against the Mahommedans having taken place about this time, encouraged the Maravars (brothers Murathoo) to continue their rebellion, and which gave rise to the Polgar war. Prior to this, and while the Mussulmen were in power, the revenues due to the Nabobs of the Carnatic by the Maravars had to be collected by an armed force; but in consequence of subsequent troubles the Nabob of the Carnatic had to apply to the English for assistance in this matter. The required assistance was given by the despatch of an English detachment, under the command of a field-officer, to Shevagunga, and resulted in the brothers Murathoo being driven from place to place, taking their final stand in the jungles of *Kuliar Kovil,* where was

* The name of a low-caste tribe. † Name of a temple.

‡ Dummy, dumb man.

fought the famous battle of that name. The Maravars were defeated, and the *Murathoos* taken and hanged. In Tripatore there is still to be seen a ruined bastion, on the top of which is stuck a pole, marking the spot where this famous chieftain was hung. Tranquillity was soon restored.

In 1802 Lord Clive issued a proclamation, calling upon the members of the Shevagunga family to attend at the village of *Sholaporam*. With the object of conciliating the people, the Government was anxious to re-establish the old Nalcottai family, when the elder brother of the two who fled to Tanjore, to escape the persecution of the brothers Murathoos, came forward, and abdicated his right to his younger brother, whereupon the Government publicly installed him at Sholaporam as Zemindar of Shevagunga. In consideration of the elder brother having abdicated his right, a few large villages, which were formed into Paliapett of Pudonaton, were given to him, and which is still enjoyed by his descendants.

About this time the permanent settlement was introduced, and *Istimarar Sunnud** was issued to Gowry Vullaba Taver; hence he is known as the Istimarar Zemindar. He ruled for about thirty years, and on his death the zemindaree was usurped by his nephew, the son of the Polgar of Padamatoor, who ruled for two years and died. On his death his son Bodagooroo succeeded; but soon after the estate was involved in dispute, and litigation has been carried on for the last thirty years.

After various decrees in this country, an appeal was made to Her Majesty's Privy Council on behalf of the widow, the present Ranee, *Kothama*, alias *Kolundapauny Natchiar*, the whole of whose family were driven out of the country. She sought protection in Ramnad for some time; and finally, in 1856, found her way to G. T. Fischer, Esq., at Salem, and through whose persevering exertion on her behalf she eventually obtained possession of her fatherland and home. The trials and hardships she underwent are painful to relate. She seemed indifferent as to the result of her appeal to the Queen, and when she received intelligence of the success of her appeal, she did not exhibit emotion of any kind.

* Permanent order, or warrant, to hold land.

The Ranee is the mother of several children, three of whom are now alive—one boy and two girls. Her age is about forty-five years; height, about 5 ft. 2 in. Her character is combined with simplicity and goodness, and her faith superstitious.

She rises at seven A.M., and visits her daughters at eight o'clock. She goes to the pagoda, where she bathes her body, casts off her white clothes, and decks herself with red silk cloths; goes through various unmeaning ceremonies; puts her shrine-marks, which consist of holy ashes; and then goes into another room, changes her silk for her usual white cloth, and proceeds to her audience chamber, where her superintendent or *carbar* meets her, and informs her of all that is going on in the estate, etc., when she issues such orders as may be required, and returns to her palace to partake of her morning meal, about eleven or twelve o'clock. Her food is partaken off a plantain leaf or a golden plate. The meal consists chiefly of curry and rice, with milk, plantains, fruits, and sweets, etc. The curry consists chiefly of vegetables, prepared in various ways. After her meal she chews her betel and nut, and then goes to her other apartments, where she listens to stories or any other information she can get from her women, and in a few minutes she falls asleep. She awakes again at about two or three o'clock in the afternoon, when she again visits her daughters in their own apartments in the palace, which adjoin each other. Her movements are very slow, and she is followed by a number of women. On her return she calls for her daughters and all her women, and gets them to join her in prayers and singing songs in the enclosure in front of her palace, whilst herself and daughters look on with amusement. The goddess she offers poojah to she calls "*Royar* Royar Esperro.*"† Whenever the Ranee enters the pagoda tom-toms are beaten, and, as a rule, this occurs every morning and evening. She returns from her pagoda about eight or nine o'clock in the evening, takes her supper, and retires for the night.

The population chiefly comprises Marawars, a tribe of a low

* King, or Emperor. † A term applied to the wives of Vishnu.

caste, warriors at one time. They are supposed to have been thieves. There are several peculiarities in these people, the chief of which is the mode of dress of the women, their love of ornaments, and the system of piercing the ear-lobes, so distending them as to touch or reach the shoulders. I will now briefly describe each.

The boring of the ear is invariably performed by men of the *Corava* caste, and the operation is generally carried out during infancy, when the child is a month old. The operation consists first in piercing the lobe of the ears with a stout needle, and a cotton ligature is passed through the orifice and the ends secured by a knot. To this salt and water is applied, which is continued for a day or two, when the ligature is taken out, and a piece of broomstick is now forced into the ear, which is renewed for a stouter stick every three or four days, when a piece of dry pith is substituted. The pith is previously moistened with water, which causes it to swell and distend the opening. This is also renewed by a stouter piece of pith every other day; and in the course of a fortnight or so pieces of cloth, steeped at first in salt and water, afterwards in castor-oil, are substituted; and in about a month or so leaden or brass weights are fixed to the lobe of the ear, the weight of which is gradually increased till the bottom of both ears meet across the root of the nose in one direction, and touch the shoulders in another, when the process is considered complete and satisfactory.

I took off leaden weights from several children under a year old, each weighing one ounce. The weights are continued for some years, to prevent the lobes shrinking up again. Under this system the part gains vigour; but if at any time there are indications of the ear-lobes being likely to give way under the strain of the weights, they are either removed or lightened for a time. As the young lady approaches puberty, massive golden ear-rings take the place of lead, while in the poor it is changed to brass. The dangling of the ear-lobes on the shoulder is considered very ornamental. This is not the only opening made in the ear: the helix along its upper part is also pierced in three places, and decked with jewels. Each jewel is of a peculiar shape and design. The uppermost jewel worn in

the ear is called a kuppu, and generally consists of two pieces connected with each other by a rod and a screw, the latter being screwed into the rod when it is inserted into the ear. The lower part of the ornament frequently has a cluster of pearls or precious stones hanging from it amongst the rich; but the poor frequently substitute for them coloured pieces of glass.

The next ornament is termed *vesary moorgo*. It consists of a pendant merely, and is generally studded with precious stones.

The third jewel is called *orenapu*. It has a roundish form, and may also be studded with jewels; and the fourth, which generally consists of one or more massive pieces of gold, filagreed, of various forms, but most frequently of the form of a signet-ring, dangles on the shoulder.

The practice of piercing the lobules of the ear does not appear to be restricted to the Maravars only; but in the south other castes, such as the *Vellaher, Agembadier, Kuller, Cowherds, Vaniers, Chetlies*, and others, resort to the same practice, and when the operation is perfect it is termed *Thola Cathoo*. The only exceptions seem to be amongst the Brahmins and Gentoos. The opening thus formed in the lobule of the ear frequently gives rise to accidents by getting torn through. At Chengleputt, where the opening in the lobule of the ear is about one twelfth the size of what it is further south, is constantly being torn through, from accidents arising from the occupations of native women in gathering sticks, and attending to other household work; and during quarrels or fights with each other it is also frequently torn through; and on an average I used to have from ten to fifteen cases annually of torn ear coming for treatment to the dispensary. From the greater size of the opening in the ears of women in the Madura district, accidents of this kind, I should think, must be much more frequent. Perhaps there is no accident that can happen to a native female, no matter of what caste, that causes so much anxiety to the patient and her friends as that of a torn ear, which is termed *Moolee Cauthoo*,* and is considered a great

* Moolee cauthoo, defective ear.

disgrace, on which account they are particularly anxious to have the injury as soon and as quietly as possible repaired; and they submit patiently to have the edges pared afresh when necessary, and the ends brought together by a silver wire suture. Even girls of six and seven years of age will sit like blocks of wood, to have the operation of mending carried out; and in these cases, if care be taken to bring the raw surfaces evenly together, the parts unite rapidly in the course of some three or four days, and in about three weeks or a month after they are able to put on their ear-rings as if nothing had happened.

The style of dress of the Maravar women differs from other castes, except that of the *Agumbadiers*. It consists, like that in use among other native women, of one entire piece, varying in length from thirty to fifty cubits, and from three to five feet in breadth. It frequently has a coloured border on either side, more especially when white; the outer end is also covered. This portion is frequently embroidered in silver or gold amongst the rich, and simply coloured by the poor, and is called *moonthannee* * by name.

In tying on the cloth, the plain end is gathered into folds to the extent of some fifteen or twenty cubits, held in the hand and placed behind at the waist, while the other portion is moved round the body, and the portion gathered is allowed to fall over to the depth of from twelve to eighteen inches. This is termed the *kosavum* (folds), and is allowed to fall over in graceful folds, forming a kind of upper skirt, and gives the woman a full appearance about the hips, as the folds encircle three parts of the person from behind. This is practised among all castes of women, who use the native cloth or *saree*, but the kosavum, as it is termed, is not so extensive, and is only confined to the right side by a small fold or gathering, which is scarcely visible. The ornamental end of the cloth is now carried across the back and over the left shoulder, and the embroidered part itself opened out in front. Widows wear white clothes only, but married women can use coloured cloths.

* Moonthannee, or front piece.

Hair.—Among Maravar women the hair is put up differently to what natives in general do. The hair is set on the top of the head in such a manner as to give the wearer a tallish appearance. It is parted along the centre into two divisions, that of either side is crossed over and tucked inwards from the front, whilst the ends are left peeping out and playing with the breeze.

The men are much better looking than the women. They are tall, have a fine intelligent appearance, a robust form of body, and somewhat martial appearance. Their heads are well formed, with a raised expansive brow, large and intelligent eyes. I regret that I had not the means at command of taking their measurements and weights.

I shall now conclude this paper with the ceremony connected with the installation of the present Ranee in her rightful place, after a dispute of some thirty-five years.

The installation is termed the *Puttum*, or Assumption of Dignity, and was carried out on the 10th of October, 1863, to witness which the whole of the Shevagunga zemindary population was invited, and to attend at the general merrymaking. This was fully taken advantage of; but at the same time the more sensible people evinced much sympathy for the Ranee herself, whose family had for the last thirty-five years been deprived of their patrimonial rights.

On the conclusion of the *Dusserah** festival, it is usual among Indian princes, on attaining permanent command, to carry out the ceremony of shooting the arrow. The day is universally celebrated by the Hindoos, in all parts of India, in token of the destruction of the giant king, Mahishuren.

At mid-day, and about a mile from the palace of Shevagunga, was selected a spot for the carrying out of the ceremony. State preparations had been going on in the palace from daylight. The flags of *Hanooman* (Monkey God) and *Gerooda* (Brahmin kite) were seen to float over the palace. Tom-toms, cannon, and other noises kept concerting. The Ranee, after her usual ablutions and poojahs, was presented with the usual *prasathun* (holy food) by the parobuthan, or family priest. This

* A ten-day Hindoo feast in honour of the goddess Kali.

prasatham comprises plantains, cocoa-nuts, betel, flowers, sandal-wood, and *tirunoor*, or holy ashes. The priest then requested permission to commence the ceremony of installing her into the seat and honours of her forefathers. Having obtained the necessary permission, he departed to the palace pagoda, where some hundreds of Brahmins, Priests, Gurus, Josiers, and Shastrias had assembled to assist on the occasion. At the auspicious hour the parohithan commenced the ceremony of *Poonihaha* Vacchanum*, to purify the palace, and with that view spread some raw rice on the granite floor of the temple near the doorway of the pagoda. On it he placed a brass pot filled with water, the mouth of which was covered with mango leaves. After some unmeaning ceremonies and muntras were repeated in honour of *Varuna*, the God of Waters, the mango leaves were removed from the mouth of the pot, dipped into the fluid, and the place sprinkled with the water.

Next followed the invocation of *Vignasperen*, who was represented by a conical mass of ground turmeric, and which was placed next to the brass pot. The *purohithan* then, with a tray full of rupees, rose and addressed the assembled Brahmins in Sanskrit, in honour of the occasion; and after having requested their prayers for the prosperity of the Ranee, the distribution of the rupees followed. After this commenced the *Jepums*, or prayers of the Brahmins, their hearts having been previously gladdened by the rupees, and they began the ceremony of the *Navadanim*, by the spreading of nine different kinds of grain, each separately covered by plantain leaves, forming tiers one over another. These were surmounted by thirty-five brass pots, of sizes, filled with water from the tank in front of the palace. These vessels had their mouths covered with leaves, flowers, fruits, cloth, sandal-wood, and money, and the *chuckrum*, or astrological symbol, was also deposited by them. The Brahmins, during their recitations of prayers, threw rice mixed with saffron (or turmeric) against the vessels of water. At the same time camphor and incense were ignited and cocoa-nuts broken. Betel leaves and flowers were again deposited opposite each

* Purification.

pot, after which a crown, of the form of a ducal coronet, studded with gems, and said to have cost fifteen thousand rupees, was brought forward by Mr. Fisher, the agent, and handed to the purohithan to be consecrated. This was done by placing it at the feet of *Vignasperen*, and holy water made ready (*i. e.*, water from the rivers *Ganges*, *Cauvery*, *Vigay*, *Ramiserum*, *Tripaty*, *Palany*, and others). The Ranee having finished her devotions, came forth at the auspicious hour of eleven A.M., conducted by her female relatives, when she was led to the *Kurruncul** *Chawkai*, or Installation Place, in use in the Zemindary, which is an open, court-like building, of a square form, and constructed of granite, having in the centre a raised platform twelve feet square and three feet high, with steps on the east and west sides, the roof being flat and square, supported by marble pillars; and within this building is placed a platform formed of a marble slab, nine feet by five, and two inches thick, supported by eight crouching lions about two feet from the ground.

On this platform the Ranee, now decked in coloured silks, seated herself, surrounded by her family and relatives. The officiating priest and his assistants then repeated their *muntras*, and held over the head of the Ranee a silver strainer, into which the holy water was poured, and the spray from the thousand perforations broke over her person, after which water from the different consecrated vessels was collected and poured through the strainer (called the *Sashasra dahara Kamahum*,† and is believed to contain exactly a thousand perforations); after which the coronet was placed on the Ranee's head by Mr. Fisher, the agent, while the Brahmins invoked unnumbered blessings for the prosperity and happiness of the family of the Ranee and the Ranee herself. Thus was completed the *Puttabee Shagum*, or Installation of the Ranee. The usual din and uproar from tom-toms and congratulations made the place resound again.

The Ranee, dripping in holy water, was now conducted to her private temple, where she changed her wet apparel for a spotless white muslin; and having ornamented her person with

* Granite seat. † Vessel with a thousand perforations.

jewellery and abundance of marks of sacred ashes, she retired with her female relatives to the palace pagoda, there to return her own thanks to her God, and which she carried out by prostrating herself before a lamp that was burning at the foot of one of the idols in the covil, or pagoda. She then returned to the *Chowkai*, and commenced the distribution of gifts, the chief of which consisted of ghee, or clarified butter, and Gingely oil. A cup of ghee was now offered to the Ranee, in which she was to behold her reflection; and to avoid looking at the presentee's countenance, a looking-glass was given her to admire her own reflection. A similar ceremony was gone through with the Gingely oil, and after which distributions of presents of money took place, and the people dispersed.

Now followed the *Wesa Danum*, or ten gifts prescribed by the Shastries for the absolution and remission of sins. These comprised land, cows, gold, silver, cloth, ghee, grain, sugar, salt, etc., followed by a tray containing saffron, coloured rice, cocoa-nuts, plantains, sandal-wood, and tirunnor (holy or sacred ashes), collected by the several officiating Brahmins during the different ceremonies. These were offered to the Ranee, and with the pronunciation of different muntras (prayers) the rice was thrown at her; and at the conclusion a few gains were placed on the crown of her head, and her forehead smeared with holy ashes, upon which the collected Brahmins, having invoked endless blessings, departed.

The ceremony of shooting the arrow was now commenced; and, in the instance of males, the ruling Zemindar himself should conduct the ceremony by his presence; but as the Ranee could not appear in public, she sent her son to represent her on the occasion, who prepared himself by prostration before the temple deities. He then received from his mother the five arrows that were to be shot. These he delivered to the officiating Brahmin who had hitherto conducted the *Dusserah*, or ten days' festival, and then proceeded in procession to mount his elephant, which, in gay trappings, awaited his pleasure at the gateway.

The animal employed on such occasions is usually white, but there being none, the usual elephant was painted white for the

occasion. Having mounted the elephant, in company with two of his uncles, he proceeded to the spot where the ceremony was to take place. The image of *Vignasperen* in his vehicle, the bandycoote mounted on a car drawn with drag-ropes preceding him. Next followed the master of ceremonies, the Brahmins with the arrows, mounted on an elephant; after which came the white elephant with the Ranee's son and brothers-in-law, accompanied by dancing-girls and a large crowd of spectators. The place selected for the purpose had a pandall erected thereon, giving cover to a space of twenty feet square, the sides enclosed, leaving only an archway opening leading into the interior, in the centre of which was what is termed the *"Vunnee Marum"* (Prosopis Spicigera). The procession then went round the shed twice; and on the third time, while the elephant faced the east, the master of ceremonies shot an arrow in the air in that direction, then turned round, and did the same to the other cardinal points, a sheep being sacrificed at the different localities on which the arrows descended. The fifth arrow was then shot at the *Vunnee Marum*, and the ceremony concluded. The procession then returned home.

This ceremony of *Vunnee Marum* shooting occurs in most parts of India, at the termination of the Dusserah, and is carried out in commemoration of the great battle between *Mashihasooren*, the King of Giants, and *Doorga*. The fable runs thus: That in consequence of the tyranny of Mashihasooren, on the representation of Indra, the King of the Gods, to *Vishnu*, his anger at the relation of the atrocities of Mashihasooren was so great that the earth shook like a leaf, and he produced the Female Deity known as *Muhamya*, or Doorga, the passive principle of nature, and who undertook the destruction of the Giant King, and the battle that ensued lasted some ten days, terminating in favour of Doorga and the death of Mashihashooren. For this success the Gods returned thanks to the victorious *Doorga* for having delivered them from so great an enemy. It appears that whilst perambulating in her chariot in pride, she shot out four of the five arrows she carried at the four cardinal points, whilst the fifth was the one that destroyed

the giant, and is considered emblematical of her having conquered three worlds; and promising succour to those who sought her, she vanished.

On the return of the young Zemindar to the palace, his mother, the Ranee, awaited him at the Installation Room; and on his making his appearance there seven Brahmin virgins, the eldest carrying a brass dish containing saffron-water*, presented themselves. The dish of saffron was encircled around the heads of the Ranee and her son seven times, for the purpose of averting the evil eye; and after having received presents of cloths, they were dismissed. The Ranee then proceeded to the "*kaliana mahal,*" or marriage-hall, where her children, relatives, and female servants came and prostrated themselves before her, in token of allegiance.

In the evening the young Zemindar, the Ranee's son, held a Durbar, in lieu of his mother, to receive obeisance and respect from the several *Devastarums,* the heads of the *Nats,* or feudal divisions of the zemindary, and the chief Brahmins, the *Stanigals,* or trustees of the various pagodas, took precedence. The chief Stanigal sat down before him, and offered him two brass or clay chatties, containing *parasathum,* or holy food. This the Ranee's son accepted by touching them, while an attendant emptied the contents and returned the chatties. Then the Stanigal rose, and touched the young gentleman's brow with holy ashes, and retired. The heads of the different pagodas went through a similar ceremony. Then the heads of the Nats advanced with offerings of sheep. They prostrated themselves before him, and craved his protection to their rights and privileges according to *mamool* (custom). These were followed by the Dowmasavum Brahmins, who numbered five hundred. These sat down and offered their blessings in Sanskrit, each one presenting a cocoa-nut smeared with saffron. At the same time about two thousand rupees were being distributed to begging Brahmins at the palace gateway.

Then followed a nautch, with dancing-girls, of whom there

* Saffron-water mixed with lime, chunaan, is in common use for destroying the "evil-eye". The dish containing it is encircled around the person.

were twenty-four sets. Sandal-wood, betel, nut, and garlands of flowers were profusely distributed, and the Tamasha kept up till daylight.

Thus terminated the installation of Streemathoo Moothoo Vigia Ragoonadha Ranee Kuthama, *alias* Kolundapoony Natchiar.

For much of the information connected with the habits and manners of the Ranee I am indebted to Miss Fischer, whose intimacy with that personage has enabled her to furnish me with the necessary information. I am likewise indebted to R. Fischer, Esq., B.L., for much information on various points, and as to the installation ceremony and the shooting of the arrow.

I have chiefly abridged these from a paper furnished by Mr. Fischer to one of the daily newspapers, a copy of which Mr. Fischer kindly placed at my disposal. To Miss Fischer I am likewise indebted for the photographs which I have the pleasure to submit with this paper.

XV.—*Report on Excavations in Caithness Cairns, conducted for the Anthropological Society of London by Messrs. J. Anderson and R. I. Shearer, in* 1866. By Joseph Anderson, Loc. Sec. A.S.L.

In a previous report I have detailed the results of our explorations in the chambered sepulchral cairns of Thrumster, Ulbster, and Camster, Caithness. In the course of our investigations into the structural characteristics of these interesting cairns, we were fortunate enough to succeed in elucidating completely the hitherto unknown structural character of the long cairns with expanding crescentic ends, whose peculiar features are in that report for the first time described. We were also fortunate enough to fall in with an entirely new type of cairn structure, uniting the characteristics of the previously mentioned long or "horned" cairns with those of the common or round cairn, whose exterior form is defined by a circular enclosing wall, and containing a central tri-cameral chamber. As we had then examined only two examples of the long cairn with "horns" or crescentic ends, and had found but one of the short kind with horns, our attention was primarily directed to ascertain if there were more examples of either type among the few sepulchral cairns in the district which still remained unexamined. We have again been so fortunate as to find an additional example of each of these kinds, both being exteriorly almost the exact counterpart of those previously described, but presenting considerable difference in the arrangement of the internal chamber.

The Cairn of Get. Short Cairn with Horns.

The cairn of Get, as it is locally termed, is situated in a hollow at the south-east end of the hill fort of Garrywhin. From an examination of its exterior we had judged it to be of the same type as the horned cairn at Ormiegill, previously described. It had been partially disturbed and the apex removed during the construction of a dam close by; but we soon satis-

fied ourselves that neither its chambers nor passage had been laid open, and its external enclosing walls had not been laid bare. On digging down into the chamber, we found the walls unbroken all round to the height of from five feet at the lowest to between eight and nine feet at the highest part, and showing a very distinct convergence for the roof at the height of six to seven feet above the floor. The passage walls were also continuous and unbroken, but the lintelling was gone. The whole chamber and passage was filled with a confused mass of stones, which being entirely cleared out, the floor was found to be perfectly undisturbed, and the rubbish over the floor of the passage seemed equally undisturbed. In fact, although the apex had been taken off the cairn, and some of the lintels taken off the passage, in the search for large stones for the dam, it was perfectly clear that the workmen had not gone deeper than to try the cairn for big stones; and finding none suitable that were easily got at, they had abandoned the search, and gone for what they wanted to the walls of the hill fort close by.

When thoroughly cleared out, the chamber in this cairn, instead of being tri-camerated, as we had heretofore found them, was bi-cameral. The first compartment, as usual, was small and rectangular. It was separated from the other and main compartment by two large and heavy flags set across the floor, and leaving a passage between their opposing edges. But the remainder of the chamber was not subdivided again by the formation of a small compartment as usual at the back. It was thus the roomiest chamber we had met with, and was much more nearly circular in its outline than any of the rest. The two large slabs that would have formed the division between the second and third compartments were not wanting, but they were set with their faces in the wall instead of across the chamber. The customary large slab at the back of the chamber facing the passage was also in its place as usual.

The entrance-passage opens to the S.S.W. It is eleven feet in length and two feet six inches wide at the outside entrance, widening gradually till it enters the chamber, where it is fully three feet wide. The lintels being gone, the height of the

passage could not be ascertained, but it could not have been over three feet at the outside, where the slope of the cairn would bring it down to something like that height.

Measuring across the centre of the floor from sidewall to sidewall, and from front to back between the divisional stones and the upright slabs forming the jambs in the entrance from the passage, the first compartment of the chamber is only six feet by four and a half.

The second or principal compartment, approximately circular in form, encloses an area which measures eleven feet from sidewall to sidewall, and ten feet from front to back. Owing to the walls being built along with and over the top of the great slabs set into them, as previously described, the circular form of this compartment is more nearly that of an irregular octagon on the ground plan. The slab which partly forms the back of the chamber is five feet across the face, and rises four feet in the wall, while those on either side are each four feet four inches across the face, and rise to about the same height in the walls. Above that height the building is gradually brought to a more circular form; and as the slabs and the lower part of the walls incline slightly outwards, this is corrected by the masonry over these being brought gradually forward, till at the height of seven feet the overlapping and rapid convergence for the roof begins. The contour of the chamber would thus be something like a barrel set on end.

The external structure of the cairn forming the horns is the same here as in the Ormiegill case. A double wall, or rather a wall built parallel to and leaning against another, runs all the way round the outside of the cairn, so as to give it the peculiar outline shown in the Plan No. 1. Both walls are faced to the outside only. The distance from the face of the outside wall to the face of the one behind it varies slightly in different parts, ranging from two and a half to three feet. The horns are slightly convex at the tips, which are four feet across. They project in front of the body of the cairn twenty-two feet, and backwards behind the body of the cairn fifteen feet. The front horns are forty-eight feet apart at the tips, and the hinder ones the same. The extreme length of the structure, from the tip

of the front horn to that of the hind horn on either side is eighty feet: and the extreme width from point to point, both before and behind, is fifty-six feet; the width of the body of the cairn across the centre being forty-six feet.

The contents of the chamber yielded some very interesting results. In the first compartment we found the only collection of skulls in a sufficient state of entirety to admit of removal and preservation, that has been obtained from the Caithness chambered cairns.

In the first compartment lay a number of skeletons, the heads having been all placed to the right side of the entrance, as if the bodies had been laid athwart the doorway. The entrance passage opens to the S.S.W. by compass, so that the bodies would be laid with the heads to E.S.E., and the feet to W.N.W. From the fragmentary condition of several of the skulls and the decayed state of the other bones, the exact number of skeletons could not be ascertained, but we judged that there could not have been fewer than seven or eight. The skulls of more than half of these were pretty entire and in good preservation, considering the quantity of stones and rubbish that lay above them. The other portions of the skeletons were very much decayed, the middle of the floor being a little lower and wetter than where the skulls lay. From the number of individuals crowded into the small area (six feet by four and a half), there was no possibility of determining to which particular skull any of the other bones belonged. Neither could we ascertain with certainty whether the bodies had been deposited at full length or doubled up, though from the fragments being found all over the floor, I incline to the belief that they may have been laid at full length. On the character of these skulls I shall venture no opinion further than to state that they appear to me to be remarkably well formed, and that heads of a much more degraded type may easily be found on the shoulders of many men of the present day.

On the floor of the main compartment of the chamber there was the largest accumulation of ashes, mixed with bones, burnt and unburnt, and pottery, that we have found in any of the cairns. In the centre it formed a compact mass of about

eighteen inches in thickness. We examined it most carefully as it was lifted, and found it plentifully mixed with wood ashes and charcoal, many of the fragments indicating pieces of wood of very considerable thickness. It would be very difficult now-a-days, in a treeless country like Caithness, to obtain as many sticks as would make a fire within a circuit of many miles; but the people who kindled these great and long-continued fires in the cairns appear to have had no difficulty in obtaining wood for fuel. We found no piece of wood unburnt, though bones unburnt at one end and completely charred at the other were of frequent occurrence.

The quantity of burnt and splintered bones intermixed with this layer of ashes was very great. The bones got on the surface of the floor were unburnt. Human bones were mixed up with those of the horse, dog (?), deer, ox, and swine, in indiscriminate confusion; and both the human and animal bones bore the same unequivocal evidence of being wholly burnt in some instances, and only partially placed in the fire in others. The human bones were those of very young children as well as of adults. In this compartment the skulls occurred only in small fragments, and in several instances nothing remained of them but the teeth.

Scattered through the mass of ashes and bones were chips and flakes of flint in great abundance, some completely burnt, and others quite free from the action of fire. A few of these flakes are chipped to shape as if intended for arrow-heads; and one beautifully finished arrow-head, an inch in length and fully half an inch broad, was found imbedded in the mass. It is more leaf-shaped than heart-shaped, and chipped all over the side as well as on the edges, being brought to an extremely fine sharp point.

Fragments of pottery were also abundant. They were of the usual kind, and, with one or two exceptions, unornamented. The single pattern of ornamentation which occurred in this cairn was that formed by indenting the clay with the finger-nail—a style of ornamentation abundantly found in the round cairns, but of which the one or two pieces found here are the only examples met with in the horned cairns.

Long Cairn, Camster, with Horns.

This long cairn, the external appearance of which is figured from a photograph in my previous report (*Mem. Anth. Soc.*, vol. ii), was such a formidable undertaking that we had considerable hesitation about commencing it. From the appearance externally of its eastern end we had reason to believe that we should find the chamber entire, with the roof on it. And so, indeed, it proved, although all our previous knowledge of the other horned cairns and our conclusions from analogy regarding its internal arrangements were quite at fault. Although this extraordinary and extensive cairn yielded us absolutely nothing in the shape of contained relics, we succeeded in elucidating its structural characteristics and the internal arrangements of its contained chambers, which were quite peculiar.

The entire length of the cairn, measuring from the lines across the tips of the horns at either end, was 195 feet. Its width, at the highest or eastern end between the tips of the horns, was 64 feet, and at the western end 32 feet. The central line of the cairn ran along the ridge of a hill which gave it an appearance of greater elevation than it really had. Its bearing by compass was north-east and south-west, and, like all the long cairns, the end looking to the eastward was the highest, reaching in this case an elevation of about 15 feet. Looking at the cairn sideways, it had the appearance of a number of hummocks of stones joined on to each other along the ridge. This turned out to be the key to the interior arrangement, but having in former instances found the chamber opening midway between the horns at the highest end of the cairn, we set to work there in the belief that there the entrance passage must be found. We were also the more induced to persevere in trying to find the passage there, as we believed that when we got into the chamber we should find the roof standing, and, though we might easily have forced an entrance into the chamber by removing the apex of the cairn, we wished to preserve the roof entire. After having driven an opening on the level of the ground a considerable way into the mass of

the cairn, directly in the centre between the two horns, we came upon the outer wall, which defines the crescentic ends of all the horned cairns. But here, to our disappointment and perplexity, there was no opening. The wall was well-built, and about five or six feet of its height remained standing, but where the passage ought, from the analogy of the other long cairns, to have opened through the wall, there was neither break nor opening to be seen. It then occurred to us that if the crescentic structure forming the horns had been added after the rest of the cairn was completed, the wall might have been built across the doorway of the chamber so as to shut it up. Accordingly, we broke through the outer wall and found the usual second wall of the outer structure running parallel with it at a distance of three feet and a-half behind it. Behind this second wall the mass of the cairn for several feet inwards showed no signs of a passage. Thus baffled, we had no resource but to force an entrance directly into the chamber from the top. While this was being done it was found, by clearing away the mass of the side of the cairn, along the south-east side, so as to expose the retaining wall on that side, that the passage opened there instead of in the usual way, between the horns at the end. The mouth of the passage was thirty feet back from the extremity of the cairn, and ran out at the side just under the apex of the first and largest hummock. Following up the clue thus obtained, another passage was found running out from under the apex of the second hummock fifty feet further along. The great height of the cairn and the enormous labour of clearing out the chambers from the top, together with the distance (fifteen miles from Wick by the road) obliged us to content ourselves with the exploration of these two chambers, and, as we were not stimulated to further examination by finding a single relic in either, we did not try the lower part of the cairn, in which it is probable that there may be two or three more chambers still unexplored.

The first passage, entering thirty feet from the north-east end of the cairn, is very low, scarcely exceeding two feet in height at the entrance. It goes in straight across the cairn for seventeen feet, where by a flat stone set up on either side

at a considerable angle, the direction of the passage is changed fifty degrees towards the north-east end of the cairn. It then runs irregularly winding for seven feet further, when it terminates in a low bee-hive shaped cell, instead of the usual tricamerated chamber. The first seventeen feet of the passage had large and strong covering lintels, the rest was unlintelled and much broken down.

This curious cell is formed on the ground-plan by five slabs set on edge, giving its floor an irregularly pentagonal form. Over these and between their interstices the walls are formed of small flattish stones, and carried up in an approximately circular form. At about four feet above the floor the courses of flattish stones project slightly inwards each over that beneath it until they almost meet at the top, and the dome is closed in at a height of six feet and a-half by a single flat stone about nine inches square. The stones of which the walls are built are very well and closely fitted without jointing and without much regularity of face. The floor was paved with two large and heavy slabs which did not exactly fit the area, and they consequently overlapped each other in the middle. There were no side jambs to the doorway in the wall of the cell, and, as the whole building between the cell and the bend in the passage had slid very considerably, it was doubtful whether the stones that closed the entrance to the cell had been built in or not. So great had been the slide in the mass of the cairn on this side of the cell that even the passage walls were not distinctly made out.

This little cell, when cleared of rubbish, was only high enough in the centre to admit of a man standing upright. The five stones forming the periphery of its internal area measured along the floor two feet, three feet, four feet, three feet, and four feet and a-half respectively. Including the doorway, which was about eighteen inches wide, the circumference of the room was thus only eighteen feet. A single fragment of bone was all that was found in it. We lifted the heavy slabs which formed the floor, and, on digging below, found that the clay was the undisturbed clay of the ridge on which the cairn was built.

The second passage, fifty feet further along towards the small end of the cairn, also ran directly across to the centre of the cairn, where it led to a fine large chamber of the usual tri-camerated arrangement. This passage was different from any we had yet seen as, instead of being low at the outward entrance, it was higher there than further in, and the first five feet were roofed by a horizontal arch instead of being lintelled with flat slabs. At the outer entrance, and for five feet inwards, where it was arched over by small flat stones overlapping each other inwards till they nearly met, the width of the passage was only eighteen inches. Where the passage was spanned by large and heavy lintels it widened considerably, and each succeeding lintel was placed higher than the last. Thus the roof of the inner part of the passage rose as it went inwards like the under side of the steps of a stair until where it entered the first compartment of the chamber, the roof of the passage was continued, as it were, over a portion of this compartment. Usually the first compartment of the chamber is flat-roofed as well as the passage.

On the second and third compartments the roof was wanting. The divisional stones separating the first from the second were seven feet high, and a lintel supported on two side props stood between them, the second pair of divisional stones were only five feet high. As usual, a very large slab formed the lower part of the back wall of the chamber facing the entrance and sloping very considerably outwards.

The first compartment is entered from the passage by a doorway two feet wide, between a pair of jambs two feet high, which, contrary to the usual arrangement, do not reach to the roof on account of the rising of the roof of the passage. The whole height of the doorway is four feet four inches, there being a space between the top of the entrance jambs and the lintelling of the roof of two feet four inches. The side walls are slightly curved, and the distance between them across the centre of the floor is four feet eight inches. The divisional stones not being set fair across the floor the one side is a few inches shorter than the other, but the form of the compartment is pretty nearly square, the door-jambs being four feet seven inches,

and four feet two inches respectively, from the divisional stones. Roughly, this antechamber may be set down as about four feet and a half square, about the same height at the outer end, and rising to six feet and a half at the entrance to the second compartment.

The second compartment is much larger and wider. The side walls are also slightly curved, and are distant from each other, across the centre of the floor, seven feet ten inches, the distance between the ends of the divisional stones from front to back, at their insertion in the wall, being on the one side five feet, and on the other, five feet six inches. The width of the entrance between the first pair of divisional stones is two feet and a half. The third compartment is entered by an aperture between the divisional stones, of two feet eight inches wide. This compartment is narrower than usual; but the large slab at the back, leaning outwards at a very sharp angle, makes it more roomy above than it shows on the ground plan. Measured on the floor, it is only four feet four inches from sidewall to sidewall, and two feet and a half from the divisional stones to the back slab.

The floor of this chamber was much harder and more compact than usual; and the admixture of ashes and broken and charred bones, was much more sparingly present than in any other chambered cairn we had seen. Some fragments of human skulls, and a few broken animal bones, with traces of wood, charcoal, and spots of ashes, were all the relics it yielded to a diligent search. Not a vestige of any manufactured object was found in either of the chambers; and the absence of these, and especially of pottery, was the more remarkable, that the large round cairn a hundred yards distant (*Mem. Soc. Anthrop.*, vol. ii) had yielded us so many.

Kenney's Cairn, Round and Chambered.

Kenney's cairn stands on the top of the hill above Bruan, and about a quarter of a mile from the cairn of Get, previously described. It is externally about forty yards in circumference, and, on being excavated, it turned out to be one of the ordinary round cairns, with a passage leading to a central chamber.

Its internal arrangement differs, however, from any of the round ones previously excavated. Although it has the usual division, of the internal chamber, into three compartments, the third, instead of being at the further extremity of the chamber, is curiously formed in the left hand side of the main compartment, immediately behind the first divisional stone. The main compartment in this cairn is much larger and loftier than in most of the others.

The passage, which is ten feet long, is also higher and wider than usual. At the exterior entrance it is two feet nine inches wide, and expands to a width of four feet and a half, where it passes into the first compartment, the aperture of which, however, is narrowed to three feet by the projecting jambs. The lintels remain over the passage throughout its entire length, and are large and thick slabs. The height at the entrance is almost three feet, rising to about four at the entrance into the chamber.

The first compartment measures eight feet across the floor, from sidewall to sidewall, with a breadth of four feet between the jambs, at the end of the passage, and the divisional stones between the first and second compartments. The divisional stones project each about three feet across the floor, leaving an aperture between their edges, leading into the second or main compartment, of three feet and a half. These divisional stones did not rise to the roof; and instead of the first compartment having been lintelled over, like the passage,—as is usual in the round cairns,—its roof was formed in the same way as that of the main compartment, and must have formed part of it. About four feet of the convergence of the walls remain on this compartment, the walls beginning to be brought inwards, by the overlapping of their courses, at a height of five feet above the floor. The main compartment is of a squarish form, with rounded corners on the ground plan, but gradually drawing to an outline approximately circular, as the walls rise over the tops of the three great slabs set in them, having their faces flush with the lower face of the wall. These slabs being inclined outwards, and the walls beginning to come forward at about five feet up, the circularity of the cham-

ber and the concavity of the walls, give it something of the shape of a huge kettle. Little of the convergence for the roof remains on the larger compartment however, but enough to show that it must have had a higher and more spacious dome than any we have yet seen. The extreme height of the highest part of the chamber wall remaining is nine feet. The little recess off the main chamber, on the left side, is formed on two sides by a couple of walls springing from behind the divisional stone of the chamber, and the large slab faced into the wall, respectively. These walls form the ends of the recess, the back of which is formed by a single large slab set in the ground and inclined outwards. The one end is three feet and a half, and the other two feet and a half, while the back is four feet; so that the extent of the floor is four feet by three. A single stone forms the roof; and to narrow the opening, a long slab twenty inches wide is set up, with the one end in the ground, and the other abutting on the covering stone. The height of the recess inside was only three feet and a half. Its floor was flagged with a single large stone, which lay on the top of another, and beneath both there was a layer of clay, three or four inches thick, plentifully mixed with charcoal and ashes, and under that again a third large flag, beneath which was the undisturbed subsoil of the hill.

The contents of this cairn differed from those of the cairns previously explored, in the great abundance of fragments of pottery, which were so plentifully mixed with the ashes on the floor as to suggest the idea, that there must have been either a long course of time during which broken pottery became mixed with the stratum of ashes; or that an immense number of vessels of clay must have been deposited at one time, and their broken fragments subsequently mixed with the ashes. They were almost equally abundant in all parts of the floor, and at all depths in the layer of ashes and calcined and broken bones, which was fully a foot thick. The clay below this layer of ashes was scooped, in pits in some parts, in the centre, and at these places, of course, the ashes were deeper. All over the undisturbed natural clay, the fragments of pottery were very thickly strewn, and in many instances pressed into the clay

floor, as if they had been trodden into it previous to the accumulation of ashes over them. When cleaned and sorted, the different varieties of pottery in this cairn were found to be seven, differing in ornamentation, shape, and degree of fineness. The most comman pattern was that having the single or double impression of a thumb-nail. The twisted thong-pattern, and one made of rows of scorings or scoopings with the sharp end of a pointed instrument, were also found. We got no flint weapons in this cairn, and only a few chips of flint. The human and animal remains were neither so abundant nor so well preserved as in the cairn of Get. A few small fragments of skulls, a number of teeth in the corners of the chamber behind the divisional stones, and some bones, human and animal, scattered over the area of the floor, and imbedded in the layer of ashes that covered it, were mostly too fragmentary for preservation. The animals, as indicated by their teeth, seemed to be those usually found in the other cairns,—the horse, the ox, the deer, and swine, with the dog or fox. In the passage leading into the chamber were found one of those oblong rounded stones, about five inches in length, with the ends rubbed flat, and bearing marks of rubbing all along its sides; and also a flat piece of bone, about five inches long and two broad, having one end ground smooth on both sides, to resemble the cutting end of a flat chisel. These two objects have no counterparts among the articles hitherto found in chambered cairns, but they closely resemble others found very frequently in brochs.

The Broch of Yarhouse.

From the time that we commenced our excavations three years ago, our attention had been attracted to a very large grass-grown cairn, situated in the south end of the loch of Yarhouse, scarcely a quarter of a mile below the two long cairns, with horns, on the top of the hill adjoining. Having now exhausted the district of the sepulchral chambered and cisted cairns, so far as we are aware, we resolved to open this one in order, if possible, to ascertain whether it might afford us any clue to the relation of the brochs and chambered cairns to each other in time.

This great green cairn stands on a small island, cut off from connection with the land by an artificial fosse, now silted up. The cairn was upwards of two hundred paces in circumference, around the base, and about twenty feet in perpendicular height above the shore of the loch, in the centre; and on the removal of the apex of the cairn, we found it to be a ruined broch, the main building of which was in excellent preservation, and the wall still standing to the height of twelve to fifteen feet round the greater part of the enclosure.

In two places, while removing the top of the cairn, which was composed of the ruins of the circular wall of the broch, which had fallen inwards, and filled up the central area to the height above mentioned, we found human remains among the rubbish. They were about two feet and a half to three feet under the green turf, with which the whole cairn was overgrown. In the one case, a considerable portion of the skeleton remained in wasted fragments; but of the skull the frontal and facial bones alone remained, and these were not entire. In the other case, which occurred at the opposite side of the top of the cairn, only the fragments of a skull, without any trace of any of the other bones, remained. In the passage leading to the doorway of the broch, and down at the base of the cairn, the wasted fragments of a third skeleton were found. In all the three cases, the bones seemed naturally decayed. In the third case, there was an appearance as of a kist, there being two flat stones, on edge, on either side of the bones, but the ends were not well fitted, and may have been simply the stones that had not been disturbed in the *débris* of the ruin. It seemed as if the two side stones alone had been set up, and the covering stone was simply a rough, flattish, and thick stone, not a slab. The length of the cavity corresponded with the usual dimensions of the short kists we have found in the hills about Kenney's cairn and the cairn of Get. The appearances seemed to favour the supposition, that there had been a burial in a short kist on the mound, after the original structure of the broch had become a ruin; and the fact, that the other two had been found at about the same depth under the turf, appeared to favour the supposition that they too had been bu-

ried there on the mound, by simple interment, in shallow graves, without any kist. Instances of these green cairns being used as burying places, are still to be found; and there is no doubt but that the practice of burying in these and similar mounds is itself of ancient origin. The Rev. Mr. Thomson, in the statistical account of Scotland (parish of Wick, Caithness), records the finding of the skeleton of a very tall man, in a grave formed of flagstones, set in the earth which covered the mound, formed by the ruin of a large broch at Thrumster, which is close by. Mr. John Henderson, of Thurso, informed me that a kist, with a skeleton in it, was similarly found at Dunbeath. Dr. Sinclair showed me a skull which came out of "a stone coffin" in a similar mound, at Latheronwheel. At Camster, there is a modern graveyard in which interments are yet made, the graves being dug in the face of a green mound, which has every appearance of being the ruin of some ancient structure. Mr. Petrie records the occurrence of short kists containing bronze ornaments, on the top of a mound, which, when excavated, proved to conceal the ruins of a broch. Mr. Farrer, also, describes a broch which had been turned into an ancient burying-place. It is thus perfectly possible that future explorers, digging in some of these ancient mounds, may find stone weapons and implements, bronze ornaments and weapons, stone cists, long and short, urns, and remains of burnt bodies, and full length graves, with modern coffin-plates, relegating the interment to the present century, and all intermingled in perplexing confusion. But, rightly interpreted, each series of facts will tell its own tale.

The removal of the apex of the mound disclosed a building in the centre, having all the characteristics of the brochs, borgs, or broughs, of Shetland, Orkney, and Sutherlandshire. In Caithness, hitherto, none of these buildings have been explored which have shown so much of the original plan of the structure as to enable them to be pronounced indubitable "brochs"; and so little knowledge has been gained from the opening of innumerable mounds for agricultural purposes, that it has been questioned whether anything similar to the brochs of the three counties mentioned had ever existed in Caithness.

That there were many such structures in this county,—in fact, that the face of the country was, at one time, completely studded with them, cannot now be doubted by any candid observer who knows what a "broch" is.

The broch of Yarhouse, as originally constructed, was a building formed of a single circular wall, averaging a little over twelve feet thick, and having chambers constructed in the thickness of the wall, which could be entered from the interior court enclosed by the wall, and to which there was only one entrance from the outside. The area enclosed by the wall is not a perfect circle, but very nearly so; the interior diameters, taken at right angles across the floor of the court, being respectively twenty-nine feet, and twenty-nine feet ten inches. The interior diameter originally has been about thirty-three feet, but a wall, two feet four inches thick, has been built against the main wall all round the inside, to the height of about eight feet, where it forms a scarsement, or ledge, surrounding the court. This broch differs from most others in having two entrance passages; but it seems to me that one of these belongs to the later adaptation of the building, when the lower, and in all probability the older, of the two entrance passages, was converted into a communication between the court and the cells outside the wall of the broch, which are quite evidently of later construction, being built upon the ruins of the original structure. Or if the present entrance was the original passage-way into the court, the other, which led from the court to the foot of the stair and the adjoining chamber, was converted into a communication with the later cells outside by simply breaking through the two feet of wall which intervened, and erecting a covered passage along the outside wall of the broch to the nearest cell.

The main, or present entrance to the court is on the side of the broch, away from the land, and is approached by an avenue, or covered way, not roofed over, but protected by walls on either side, which do not run straight out from the doorway, but take a considerable bend twice towards the land. Where they abut upon the outer wall of the broch, these walls are about five feet high, but at the outer extremity not more

than two feet of their height remains standing. They are irregularly built, and seem to consist of parts pieced together at intervals, the courses being broken by long, flat, and narrow slabs, set upright on their ends across the thickness of the wall, like false jambs; and two or three times they are accompanied by similar stones set on edge across the floor of the passage, as if marking the threshold of a door. At irregular intervals, similar long flat stones stand in the face of the walls, and not across them. This passage-way extends outwards from the entrance of the broch to a distance of forty-five feet, and is very irregular in width. At the broch entrance it is four feet wide. At the first cross-stone, or threshold, on the floor, it has narrowed to two feet and half. It then widens to five feet, and is again contracted towards the second cross-stone in the floor, where it is only three feet and a half wide. Immediately behind, or to the outside of this second threshold, it again widens to four feet four inches, and further on, to six feet, when it again contracts to four feet and a half, and at the outer entrance it is not more than three feet wide.

The broch entrance, leading through the circular wall into the court, faces, by compass, to E.S.E. It is five feet four inches high, thirty-two inches wide at the outside of the wall, and twenty-seven inches wide at the inside, its length through the thickness of the wall being eleven feet. It is roofed by seven stones, four of which are laid with their flat sides down, and three set on edge. Both sides of the entrance-way are finely built with flat stones, some of which are of great length, three of the largest of them measuring respectively nine feet long and four inches thick; seven feet long and six inches thick; and six feet six inches long and five inches thick. It is paved by fourteen slabs, laid crosswise, their ends passing under the walls on either side. A stone on edge, about nine inches high, ran across the inner threshold, and two flat stones stood on either side, like jambs.

Entering the court and turning to the left, at a distance of fifteen feet from the entrance passage, measured round the inner wall of the court, an opening in the wall gives access

from the court to the stair, and a large oblong chamber at the foot of the stair. This opening, as formerly stated, passing between the foot of the stair and the entrance to the chamber, now passes completely through the wall, and forms a communication with two cells of later construction outside. After passing through the wall, it enters a narrow and somewhat tortuous passage, in some parts not over eighteen inches wide and thirty inches high, which leads first to an irregularly built cell of squarish form, with rounded corners, and about nine feet in diameter,—an opening in the wall of this cell, leading into the next, which is about double the size.

The chamber in the thickness of the wall of the broch, at the foot of the stair, is about three feet wide throughout its length of thirteen feet, terminating with a rounded, somewhat arched extremity, coming up from about three feet above the floor to meet the roof, which is flat, and formed of large lintels laid across at the height of six feet above the floor. These lintels, instead of being laid on their flat sides, are set on their edges, so as to resist the pressure of the superincumbent mass of building better. The stair, which is three feet wide, extends upwards for twenty-one feet of sloping height. It is formed of rough flagstones, the steps being under six inches in height, and so very narrow that they scarcely afford a foothold. Sixteen steps up there is a landing, or platform, about five feet long, opening from which an aperture, like a small window, looks into the court: above this landing there are only five steps remaining.

On the opposite side of the court from the last-mentioned entrance, and twenty-seven feet round from it, another passage, four feet and a half wide, and running for six feet into the thickness of the wall, gives access to other two chambers on either side, also built in the thickness of the wall. The one to the left is similar in form to the one at the foot of the stair, being four feet wide, ten feet eight inches long, and six feet high; roofed, also, with a rounded, slightly arched end, and lintelled over, throughout its length, with long narrow blocks set on edge. To the right of the entrance, a passage —of which the one side has fallen in, and which seems to have

been about four feet wide and six feet long, and two feet and a half high—leads to a sub-rectangular chamber, nine feet long, five and a half feet wide at the one end, and three and a half at the other. The roof of this chamber was gone, and it was impossible to tell whether it had been vaulted or roofed with flat stones laid over the slightly convergent walls.

The whole interior wall of the court bore the appearance of having been subjected to strong and long continued heat, the stones of the wall being often burned to the very centre, and split and cracked in all directions. The same thing was observed in the case of the old Strikoke broch, described in a previous report, and the whole of the rubbish which filled the court was mingled with ashes, bones, and fragments of pottery, to a height of seven or eight feet above the floor. This may be accounted for on the supposition that the court was used long after the broch was partially in ruins, and several feet of rubbish covering the original floor. Even so high as the top of the scarsement, some eight or nine feet above the floor of the passages, we found evidence of this later occupation and adaptation of the original building to subsequent purposes in the remains of two walls cutting off a portion of the area, and abutting on the inner wall of the broch so as to form cells at different levels; the one having seven or eight feet, and the other ten or eleven feet, of the *débris* formed by the ruin of the broch under their respective foundations. The stair, also, was filled with ashes up to the landing; and the marks of the fire on its side walls showed very distinctly that three or four feet of the lower parts of the walls had been protected from the effects of the fire, which had burnt and split the stones of the walls on either side above that level.

The secondary structure in the interior area of the broch, consisting of the wall built round the inner face of the broch wall, and which, for the sake of brevity, I have called the scarsement, appears to form part of one structural plan, with the divisional walls running across the court. These divisional walls are partly built, and partly formed of slabs set on edge. They run from either side of the entrance passage out into the centre of the court, thus prolonging the passage way for six-

teen feet and a half into the interior area. Then they are met by two walls formed in the same manner, and running nearly at right angles across the court, thus dividing the inner area into three enclosures. It is noticeable that although only about four feet of the height of these partition walls remained standing, the height of the narrow slabs, set on end at intervals across the structure of the partitions to strengthen them, corresponds with the height of the scarsement, the only one remaining unbroken rising to the height of seven feet nine inches above the foundation of the wall. It seems thus a reasonable inference, that the partition walls and the scarsement were not only later than the broch itself, but were originally part of one design, the object being to obtain support for a roof of some kind, over the whole court, at a height of about eight feet above the floor. That the scarsement and the partition walls were later than the original structure, is evident from the fact that the foundations of both are considerably above the level of the foundation of the original building; and below the whole extent of the partitions, fully a foot of ashes lies underneath their foundations. Among the ashes on the floor of the court, an oblong, boat-shaped, granite boulder was found, having a smoothly ground level face, polished by use, and about eighteen inches long by seven or eight in greatest breadth. Another, exactly similar in form and nearly similar in size, was found built into, and forming part of, the scarsement; possibly, the two together may have formed a rude kind of mill for grinding, by working the flat face of the one on the flat face of the other.

The clearing out of the inner area, with the passages and chambers, proved a work of much greater magnitude and expense than we had anticipated, involving the lifting of a mass of rubbish and stones thirty feet in diameter, and nearly fifteen feet deep, over the lowest part of the wall of the broch, and depositing it clear of the exterior of the cairn. It happened, too, that the circumstances were singularly unfavourable for the preservation of relics, as well as their detection in the rubbish. When we came near the bottom, we discovered that the water of the loch rose in the interior of the broch to the height of

three feet above the floor. In fact, it rose with the autumn rains so much that the workmen were unable to complete the excavation till the loch had again resumed its summer level. This was due to the fact that the level of the loch had been raised, many years ago, to supply the neighbouring mill; and thus, for about twenty years, the water has stood three feet high in the interior of the broch throughout the winter. This may explain why the quantity of bones and bone implements found in this instance has been so small, as compared with other brochs. The annual saturation must have completely destroyed any bone relics that remained on the floor.

The relics found in the interior of the broch were of the same character as those from the brochs of Old Stirkoke and Bowermadden, described in my previous report, and now in the society's museum. They consist of a curiously shaped stone implement, formed from a piece of flat clay-slate into an almost exact resemblance to the ace of spades. An immense number of "pestles" or "crushers", as they have been called, —oblong pebbles, varying from ten to three inches in length, and generally of such a diameter as to be easily grasped in the hand. Some of these are abraded on the ends by rubbing, and others by striking some substance as hard as themselves; and some are polished on the sides and furrowed by use, as if some smooth or sharp-edged object had been rubbed obliquely against them. A piece of polished stone, shaped like the modern "sharping-stone" used for reaping-hooks. A large number of flat, circular stone discs, chipped round, and varying from a foot in diameter, and an inch to an inch and a half in thickness to three inches in diameter, and less than a quarter of an inch thick. A number of stone bullets from three to five inches in diameter, some of them having flat faces worn on them, exactly resembling those from Bowermadden. A fragment of a flat circular stone, three inches thick, apparently part of a quern; and a rudely fashioned mortar, hollowed out of an unshaped block of red sandstone, about nine inches square. An immense quantity of broken pottery, most of it plain and badly burned, the clay being mixed with small stones, and the shaping of the vessels rudely done by hand. None of it was wheel-made,

though a few pieces, ornamented with the finger-point pattern, so common in the neighbouring sepulchral chambered cairns, occurred. This, with the occurrence of a flint object, about an inch in length and half an inch in diameter at the base, formed into the frustrum of a cone by a great number of narrow facets struck off its circumference longitudinally, and thus, exactly similar in character to a much smaller one found in the chambered long cairn on the top of the hill, suggests a connexion between the two classes of structures; but we are yet without any distinct evidence on that point. A number of tines of deer's horns, sawn off, and sawn portions of antlers also occurred; but no finished bone implements, and no traces of metal, were found in the interior of the structure. Several spindle-whorls of polished stone, similar to those from the other brochs, were also found.

The animal remains that were plentifully intermixed with the ashes and rubbish of the interior were, so far as we could recognise them from the teeth, the common animals of the cairns, viz., the ox, deer, swine, horse, and sheep or goat, with one or two species of fowls. A considerable quantity of the shells of the common whelk, periwinkle, limpet, trochus, and cockle, were also mixed with the bones and refuse. The bones were all splintered and broken, and frequently charred. No human bones were observed, with the exception of those found as formerly mentioned, about two feet and a half to three feet under the green turf that covered the surface of the cairn, and which are conjecturally referred to burials in the mound long after the whole structure had become a shapeless ruin.

Outside the broch, and between it and the ditch all around, a number of cells, built on the rubbish, and belonging to a later period, were afterwards explored by the aid of the Rhind bequest for the Society of Antiquaries of Scotland. The contents of these cells were, in the main, similar to those of the broch itself; but iron knives were found in two of them, and a bronze brooch, with an inscription, referrible, from the lettering, to a period not later than the twelfth century, was found in the upper portion of the cell nearest to the outside wall of the broch, and not more than about three feet under the general

surface of the green turf which covered the cairn. It lay in close proximity to the fragments of a human skull, and was presumably a burial deposit made after the cairn was a ruin.

The Broch of Dunbeath.

I have been favoured with the following account of the opening of a very interesting broch at Dunbeath, by W. S. T. Sinclair, Esq., jun., of Dunbeath :—

"*Dunbeath Castle, Oct. 20th.*

"Dear Sir,—Having observed the success which has, in many instances, attended the researches of others with respect to those structures of the primeval age, with which this county abounds, I resolved to make an experiment upon one of them myself. Accordingly I commenced operations upon a green knowe, surmounting a point on the bank of the Dunbeath river, where it is joined by the Houstry burn, and about half a mile above the village bridge. At a distance, this mound was distinguished from the surrounding peaks and promontories by its covering of vivid green sward. On closer scrutiny, however, traces of building were observable on the north and east; and on the south side was a structure, in form resembling a well, about four or five feet in diameter, which was filled and surrounded by a growth of sturdy nettles.

"Popular tradition of the former existence of 'a castle' on this spot, gave colour to the assumption that the rich turf covered something more than a heap of stones, and this the first day's work showed. Beginning on the south side, and clearing away the earth and loose stones, we found an oval chamber, with a portion of the converging roof, or dome, remaining, twelve feet six inches long, six feet six inches wide, and about thirteen feet to the highest part of the converging sides. In this preliminary experiment, I obtained the bones of various animals, among which are horns of the deer, bones of a bird, and of the cod and haddock; fragments of various kinds of jaws, the enamel of the teeth retaining its pristine freshness, although the bone bears evidence to the lengthened period of its inhumation. Along with these, the horny portion of two right hoofs of a deer, pared down upon the upper edge;

a section of an antler an inch long, chipped and ground at both ends; a rib reduced by grinding to an edge; and several bones sawn across, or fractured by a blow, are indisputable traces of its former occupation by man; while at the further end, a shell heap of whelks and limpets adjoined a few small pieces of wood charcoal, above which the marks of fire were plainly visible.

"The subsequent and final excavation confirmed my opinion, that the oval chamber formed part of a 'borg', or 'dun', whose wall is highest towards the north, the rest having fallen a prey to time and Gothic hands. It is circular in plan; consisting of two concentric walls, between which it has apparently contained four or more chambers, two only of which remain tolerably perfect. One on the north is built square, with recesses on three sides, but has the usual dome-shaped roof, terminated by a flat slab. The other is the before-mentioned oval chamber, which is on the east of the principal entry,—an opening three feet wide.

"The further search for vestiges of man's handicraft did not yield the find of implements, etc., which I had expected on first breaking open the cairn; but, on the other hand, a varied collection of bones of carnivora and herbivora. There appears to be but one trace of the human form divine,—a single vertebra of an adult, while jaws and teeth of many of the lower animals abound. Among these, there appear to me to be teeth of the ox, deer, wolf (?), boar, and stoat, with fragments of fishbones. Among this second lot was a piece of freestone, covered with numerous indentations, all nearly of the same size. One of these passes right through the stone; possibly it was used for grinding some kind of weapon. In the very centre of the enclosure, and lying on the hard clay bottom, was a small spheroidal stone, very similar to a common shore pebble, an inch in diameter. As it is neither perforated nor marked in any particular manner, I was at first inclined to pass it over; but I observed that it exhibits a great amount of polish. The effect of intense heat is discernible on the east side of the inclosure, in the reddened and disintegrated stones on that part of the wall. This appears to have been occasioned by a smelting fire, employed for the reduction of iron ore, se-

veral nodules of which were mixed up with the animal remains, and as if in proof of the supposition, an iron spearhead, five inches long, lay beside the lumps of reduced iron in that place. Further evidence of the occupation by man is adduced by the discovery of burnt grain, bere, and oats, of which I obtained a handful close to the wall, and next to the clay bottom.

"That the site of this cairn has been a favoured spot from time immemorial, may be adduced from the fact that the title of the 'tulloch' (green cairn), as it is locally termed, Dun-bheh, is given to the whole estate in the Anglicised form of Dunbeath. The etymology of the first part of this word clearly points to the nature of the building; while the latter applies to the brushwood which clothes the banks of the streams, at whose junction it is situated."

Small Burial Cairns.

A few yards from the cairn of Get, was a group of short cists set in the ground, which we examined without finding traces of either urns or bones. Close by was a small cairn, about three feet high in the centre, and eighteen feet in diameter. It was covered by about a foot of peat which had grown over it, so that none of the stones of which it was composed were visible. On opening it, we found the stones laid on their flat sides, and sloping outwards from the centre of the cairn. Round the circular base a kind of wall, about a foot high, appeared, which was met by another wall of about the same height, running from the centre of the cairn in the form of a segment of a circle. The junction of the walls presented an appearance exactly similar to that described by Dr. Hunt, as occurring in a cairn which he opened in Shetland, and which his workmen declared was a chimney. At the end of this segment of a circle, which terminated near the centre of the cairn, there was a flat stone, about two feet long by nine inches in breadth. On this flat stone, and covered simply by the stones of the cairn superposed, without any cell being built or cist formed, there lay a human skeleton, or rather, the remains of a complete skeleton. The skull was pretty entire, though much decayed on the side next the stone. It lay on the left

side. The long bones were decayed at the ends; but the arrangement of these and the ribs showed that the legs had been drawn up, so that the leg and arm bones lay all parallel to each other in front of the ribs. The sternum and lower side of the pelvis were decayed, and of the vertebræ, only a few fragments remained. The head lay towards the N.E. On the top of the skull there was a round hole, about an inch and a quarter in diameter. We conjectured, however, that it might have been simply the result of decay, arising from an angle of the stone above it pressing on that point. Beneath the foundation of the cairn, the soil showed signs of having been disturbed, and some small fragments of pottery and wood charcoal were found beneath.

Concluding Remarks.

Of the characters of the human remains, found in the cairns now described, I do not feel myself qualified to speak; but I hope they will be described by some one able to speak with authority on these matters. Those now obtained are the only skulls which the chambered sepulchral cairns of Caithness have yielded in a state of entirety and preservation, sufficient to admit of description. They are the first and only skulls obtained from "horned" cairns, of which we have now explored five, and which are as yet unknown anywhere, except in Caithness. As the sepulchral cairns of this district have now, so far as known, been all opened at some time or other, it is scarcely likely that any more skulls may be found.

In regard to the two classes of horned cairns, it is worthy of notice, that in both cases the short cairns should have yielded a larger collection both of human remains and manufactured objects than any others. While the long cairns—which are so very similar to the short ones in external form, and present a general resemblance in their internal arrangement—have been found to be almost barren of relics in the whole three instances examined; the two short cairns have been most prolific.

If we suppose, as is suggested by the appearance of the building, by the fact that a short kist containing an urn and beads of lignite was found on the floor of one of the long cairns, with presumptive evidence of its being a secondary

construction not contemplated in the structural arrangement of the chamber, by the more solid consistency of the floors, by the more decayed condition of the bones, by the total absence of ornamented pottery, and the almost total absence of pottery of any kind,—if we suppose from these indications that the long cairns are the more ancient of the two classes of horned cairns, and the most ancient, for the same reason, of any of the chambered cairns, we are puzzled to account for the complete identity of type as regards external form presented by the long and the short cairns; and puzzled, also, by the fact, that in both the evidences of cremation are in and underneath the floors, while the unburnt burials are over the burnt ones, and therefore of a subsequent period.

Again, if we suppose the brochs to have been the dwelling-places, and these chambered cairns the tombs, of the same race, we are even more hopelessly puzzled by the dissimilarity of type and similarity of contents presented by the two classes of structures. The trodden floor of ashes mixed with burnt and splintered bones of the chambered cairns, is so like the ash-covered floor of the brochs in the general, that were it not that the human bones are as many, and as much broken and burned in the chambered cairns as the animal bones, while in the brochs human bones are exceptional; and were it not that while the chambered cairns yield only weapons of war and personal ornaments, the brochs yield only domestic implements and utensils, one would be tempted to class their contents in the same category on a hasty generalisation. We have already a few slight indications which point to a possible connexion between the brochs and the chambered cairns; but the whole subject is yet very obscure. These, therefore, and many other questions of a kindred nature, must be left for future discussion, as we have not yet obtained data sufficient for determining the relations in time among the several classes of sepulchral cairns themselves, or for the elucidation of the meaning and intention of their singularly peculiar structural characteristics.

XVI.—*Note on a Skull from the Cairn of Get, Caithness, discovered by Joseph Anderson, Esq., Loc. Sec. A.S.L.* By C. Carter Blake, Doct. Sci., F.G.S., Lecturer on Comparative Anatomy and Zoology, Westminster Hospital.

The skull is of great size and weight, the osseous structure being very dense. All of the teeth were in place at the time of death, and show signs of being much worn. The age of the individual was probably about fifty, and the sex, male. The orbits are large, and the nasal bones forwardly produced. The forehead is large and capacious, and the parietal tubers broad and prominent. The coronal suture is partially obliterated, and the sagittal suture entirely so,—a *rainure* (Pruner-Bey), or depression extending throughout its posterior two-thirds, and forming slight supra-lambdoid flattening. The upper part of the supra-occipital bone is well produced, and the semicircular line is prominent. The mastoids are small; and on the right side, a small paroccipital has been developed from the jugular eminence. The foramen magnum is rounded in form, and the pharyngeal tubercle is much towards the left side. The impressions for the insertion of the masseter muscle are large. The supraorbital ridges are not developed. The inferior maxilla is very large and massive, the chin being excessively prominent; the inferior border is very thick and rounded, the posterior angle of the ascending ramus being rather obtuse. The sigmoid notch is not shallow. The malar bones are thick, but not forwardly prominent, and the canine fossæ are remarkably shallow.

Greatest length	183 millimètres
Greatest breadth	140 „
Cephalic index	·76
Facial angle	80°.

XVII.—*The Character of the Voice in the Nations of Asia and Africa, contrasted with that of the Nations of Europe.* By Sir G. Duncan Gibb, Bart., M.A., M.D., LL.D., F.G.S., V.-P.A.S.L.

A contrast of the character of the voice in the various nations of the world has never been attempted; and no traveller or resident in any particular country, whether at home or abroad, has devoted himself to the consideration of such a subject. Travellers, now and then, in their description of certain nations and tribes, speak of their loud, their shrill, their powerful, or their weak voices. Beyond the mere mention of the sound of the voice as they find it, no special desire has been evinced to dwell upon it at large. Any attempt, therefore, on my part, to describe the character of the voice in the peoples inhabiting the vast continents of Asia and Africa, and to contrast it with that of the nations of Europe might, indeed, seem to be utopian, with apparently no facts to fall back upon, or to bring forward, in support of any views that might be propounded. Nevertheless, the task, difficult though it seems to be, I have endeavoured to work out with all the energy and effort that could be devoted to its study and elucidation, to be further aided, it is to be hoped, by such remarks as those may make upon it who desire to take part in the discussion of the subject.

I may state, however, that I think I possess *some* facts, although not numerous nor abundant, that will lend their aid in the consideration of this question. These, with such information, meagre as it is, which I have endeavoured to cull from travellers, who have referred to the voices of the nations of Asia and Africa, shall be made to bear their just weight in the course of my remarks. After generalising and reasoning upon these, they shall be contrasted with the voice of Europeans, such as we commonly know it.

The general subject of the paper is of more interest than at first sight might appear, and unquestionably has something to

do with the superiority of the European over the Asiatic and African races. For convenience, the nations of Asia may be comprised under three great divisions:—

1. The natives of China and Japan.
2. The inhabitants of Tartary, Thibet, and Mongolia.
3. The natives of India and Birmah.

This division, although arbitrary, takes in the chief races of Asia, and is sufficient for the purpose of the general illustration of the voice in the natives of that continent. There are, probably, inhabitants of some of the smaller kingdoms on the southern seaboard and peninsula, such as Laos, Siam, and Anam, taking in Cochin-China and Cambodia, and even elsewhere, where the character of the voice might possibly vary considerably from that of the other nations; but on the whole I do not think that will materially interfere with the general conclusion. Siberia is necessarily excluded.

The Chinese and the Koreans, and the Japanese, according to Dr. Prichard (p. 230), belong to the same type of the human species as the natives of High Asia; but it seems, he says, among them, to have become softened and mitigated, and to display frequent deviation from that character which travellers assert is almost uniform among the Mongols.

Although I have not been either in China or Japan, my intercourse with natives of those countries abroad, together with the information I have derived from persons who have had communication with them in their native land, leads me to say that the voice, in both races, is one of a low power and feeble compass. In tone, it seldom reaches very high; and if I might compare it to any one thing more than another, I should say it was a *whining* voice. This, I feel persuaded, will strike those who have had much personal communication with the Chinese and Japanese. Their soft and quiet manner of speaking, which at times possesses a sort of metallic twang, not unlike that of their Mongol progenitors, may be due to the peculiar guttural character of their language, in which vowel sounds appear so largely to predominate. Or, again, it may depend upon a shallow formation of the larynx, approaching to that in the female sex, wherein its depth, or profundity—starting

from the point of the pomum Adami, backwards to the thick portion of the ring of the cricoid cartilage—is less than is met with in the Tartar tribes or in Europeans. Or, thirdly, it may depend upon habitual pendency of the epiglottis or cartilage, that forms the protector of the larynx in the act of swallowing. Upon a very careful consideration of the subject, together with personal observation, it seems to me that in both the Chinese and Japanese, but especially in the former, all three causes exert a more or less modifying effect, but that producing the greatest influence is the last,—pendency of the epiglottis.

No doubt, many of the Chinese and Japanese will be found to possess as good and powerful voices as are to be heard anywhere; yet very few will be devoid of the metallic twang, which gives to it a muffled character. Yet, as the vocal cords are necessarily short, intensity and loudness of sound will be replaced by quality, in which the tenor variety may predominate. Although I have examined fewer of the Japanese than their co-religionists (in part at any rate) and neighbours, the Chinese, I think the voice is clearer and stronger in them, and the epiglottis will not be found so generally pendent. Although, likewise, both nations are an industrious race, neither possesses the extreme activity or energy of their progenitors, the Tartars and Mongols, now to be considered. This is not a consequence, but an accompaniment of their peculiar voice, which is a manifestation of physical weakness pervading nearly the entire race. Nevertheless, strongly made Chinamen, with sounding voices and quick movements, are mentioned by Huc (vol. ii, p. 242).

Central Asia, comprising the great kingdoms of Tartary, Thibet, and Mongolia,—far away from the intercourse of civilised nations, and therefore not in common communication with them, like the Chinese and Japanese,—would prove a sealed book to the scientific investigator, were it not for the glimpses of information furnished by travellers, like Messrs. Huc and Gabet. The character of the voice was the last thing to enter the mind of either; yet, in their description of the natives of the three kingdoms mentioned, they do not seem to have overlooked facts and incidents apparently invested with the most

trivial importance, although oftentimes related on the score of anecdote. In this manner have I been furnished with some information, not only interesting, but of real importance and value. If the Chinese and Japanese are comparatively mild and feeble speakers from the causes mentioned, it is not so with the Tartars. In them the voice is decidedly stronger, louder, and more powerful, yet still partaking of the laryngeal or metallic twang. My authority for this is Huc, who states in his *Travels in Tartary*, "The manners and movements of these inhabitants of the desert are abrupt and jerking; their speech brief and energetic. The tones of their voice have something about them metallic and deafening. Many of them are wealthy; and with these display consists in decorating the sheath of the sword with precious stones, and their own robes with borders of tigerskin. The horses which they bring to Tang-Keou-Eul are remarkably beautiful, vigorous, well-made, and of great grandeur in the step,—in all respects far superior to those of Tartary, and fully justifying the Chinese phrase, 'Sima Toung-mieou' (western horses, eastern oxen)," p. 23, vol. ii.

I have preferred giving this extract in full, because it expresses so much, in a few words, relating to the character of the people, in which energy, activity, and determination play an important part. No wonder need be expressed in the power of the voice, which is rendered metallic and deafening from causes which shall be presently explained. A good instance of vocal character and power in the Tartar is furnished by the following extract:—

"On the day of our arrival at Tang-Keou-Eul, a few minutes before we entered the town, we met a long hair, who had been giving his horse drink in the river Keou-Ho. Samdadchiemba (Huc's servant), who was always attracted by anything having an eccentric air, cautiously approached the man, and saluted him in the Tartar fashion, saying, 'Brother, art thou at peace?' The Houng-Mao-Eul turned fiercely towards him; "What business of thine is it, tortoise-egg!" cried he, with the voice of a stentor, 'whether I am at peace or at war? And what right hast thou to address, as thy brother, a man who knows nothing

about thee?' Poor Samdadchiemba was taken all aback at this reception; yet he could not help admiring, as something very fine, this haughty insolence of the long-hair" (vol. ii, p. 24).

Samdadchiemba, who was the cameleer of Messrs. Huc and Gabet, was a young man, who was neither a Chinese, a Tartar, nor Thibetian, but one whose features partook of the Mongol race. Huc describes his face as "having no decisive character; it exhibited neither the mischievous knavery of the Chinese, nor the frank, goodnature of the Tartar, nor the courageous energy of the Thibetian; but was made up of a mixture of all three" (vol. i, p. 20). The character of his voice is not given; but "an exertion of his strong lungs" induced Tartars in the distance to turn in their saddles, and come up to him (p. 29). At night, it appears, he snored with all the might of his lungs until daybreak (p. 31). This last is significant of some pendency of the epiglottis, probably to the extent of one-half. His voice I infer to have been moderate in power; and his surprise at the reception he met with from the Tartar need not be wondered at, for in fact he had "caught a Tartar."

On one occasion, three horsemen overtook them; one of whom, whose costume bespoke him a Tartar Mandarin, addressed them with a loud voice: "Sirs, where is your country?" "We came from the west." "Through what districts has your beneficial shadow passed?" "We have last come from Tolon-Noor." "Has peace accompanied your progress?" "Hitherto we have journeyed in all tranquillity. And you, are you at peace? And what is your country?" "We are Khalkas, of the kingdom of Mourguevan," etc. (p. 39, vol. i). The *loud* voice uttered by these Tartars is so striking and impressive, that Huc seldom let an opportunity pass of referring to it. On visiting the caves of the Ortous, in Tartary, Huc relates:—

"We directed our steps to the opening of the cavern, and on reaching the threshold of the door, perceived within a large fire of hemp-stems, whose undulating flame reached the ceiling, so that the place looked like an oven. On further investigation, we observed a human form moving amidst the thick smoke; we soon heard the Tartar salute, "Mendou!" uttered by a sonorous voice, "Come and sit beside this fire." We did

not like to advance. This cave of Cacus, that loud voice presented to our minds something fantastic. Finding that we remained silent and motionless, the inhabitant of this sort of vent-hole of Erebus rose, and came to the threshold. He was neither a devil nor a ghost, but simply a Mongol Tartar, who, the night before, having been surprised by the storm, had fled to this cave, where he had passed the night" (vol. i, p. 181).

In Tartary, the women lead a very independent life, riding out on horseback at pleasure, and visiting each other from tent to tent. Differing from the "soft languishing physiognomy of the Chinese women, the Tartar woman presents in her bearing and manners a power and force well in accordance with her active life and nomad habits, and her attire augments the effect of her masculine, haughty mien" (vol. i, p. 187).

The voice of the Tartar woman is not inferior to that of the men, in power, at any rate, if we may judge from the behaviour of an innkeeper's wife, who for her obstinacy received a formidable box on the ear from her husband, which sent her into a corner, screaming at the pitch of her voice (p. 291, vol. i).

The following picture of the Mongols, as distinguished from the Tartars, in the words of M. Huc, cannot but be interesting here:—"The Mongol has a flat face, with prominent cheek-bones, the chin short and retiring, the forehead sunken; the eyes small and oblique, of a yellow tint, as though full of bile; the hair black and rugged, the beard scanty; the skin of a deep brown, and extremely coarse. The Mongol is of middle height; but his great leathern boots and large sheep-skin robe, seem to take away from his height, and make him appear diminutive and stumpy. To complete this portrait, we must add a heavy and ponderous gait, and a harsh, shrill, discordant language, full of frightful aspirates. Notwithstanding this rough and unprepossessing exterior, the disposition of the Mongol is full of gentleness and good-nature: he passes suddenly from the most rollicking and extravagant gaiety to a state of melancholy, which is by no means disagreeable" (vol. i, p. 257). I would draw particular attention to the "harsh, shrill, discordant language, full of frightful aspirates."

The Lamas of Thibet are not inferior to their brethren, the

Mongols and Tartars, in vocal power, which is manifested on the occasion of exorcising the demon of sickness. The following description by Huc has reference to prayers recited by the Lamas for the recovery of a person ill with intermittent fever. "Upon a given signal, the clerical orchestra executed an overture, harsh enough to frighten Satan himself, the lay congregation beating time with their hands to the charivari of clanging instruments and ear-splitting voices. The diabolical concert over, the Grand Lama opened the Book of Exorcisms, which he rested on his knees. As he chanted one of the forms, he took from the basin, from time to time, a handful of millet, which he threw east, west, north, and south, according to the rubric. The tones of his voice, as he prayed, were sometimes mournful and suppressed; sometimes vehemently loud and energetic. All of a sudden, he would quit the regular cadence of prayer, and have an outburst of apparently indomitable rage, abusing the herb-puppet with fierce invectives and furious gestures. The exorcism terminated, he gave a signal by stretching out his arms, right and left, and the other Lamas struck up a tremendously noisy chorus in hurried, dashing tones; all the instruments were set to work; and meantime the lay congregation, having started up with one accord, ran out of the tent, one after the other, and tearing round it like mad people, beat it at their hardest with sticks, yelling all the while at the pitch of their voices, in a manner to make ordinary hair stand on end" (vol. i, pp. 66, 67).

The same sort of vocal chaos, so to speak, is exhibited when a Lama Boktè manifests his power of killing himself, yet not dying. "At his feet, numerous Lamas, ranged in a circle, commence the terrible invocations of this frightful ceremony. As the recitations of the prayers proceeds, you see the Boktè trembling in every limb, and gradually working himself up into phrenetic convulsions. The Lamas themselves become excited: their voices are raised; their song observes no order, and at last becomes a mere confusion of yelling and outcry. Then the Boktè suddenly throws aside the scarf which envelopes him, unfastens his girdle, and, seizing the sacred knife, slits open his stomach in one long cut" (vol. i, p. 191).

During the festival of the new year at Lha-Ssa, the town is invaded by innumerable bands of Lamas, who run through the streets in disorderly bands, uttering frightful cries, chanting prayers, and fiercely quarrelling with their fists (ii, p. 218). This behaviour of the Lamas is in vivid contrast to their usual quiet behaviour, modest mien, and low and grave tone of their voices (vol. ii, p. 32).

The extracts which have been given, so clearly and yet so accurately, represent the general character of the voice amongst the races of people inhabiting Tartary, Thibet, and Mongolia, that I must be pardoned for not altering their phraseology, nor condensing them more than was absolutely necessary. The metallic and deafening tones of the voice well explain the character of the latter, as might be common to a race of people who almost habitually live in the saddle, and whose incessant activity and constant travelling contribute to render them very vigorous, and capable of supporting the most terrible cold without appearing in the least affected by it (i, p. 68). If the Tartars utter deafening cries and shouts (i, p. 110), and dispute by turns furiously and argumentatively (i, p. 120), they possess at the same time much fluency of tongue (i, p. 120). There cannot be much difficulty in arriving at a tolerably correct estimate of the condition of the Tartar's larynx from the faithful description given by Huc and Gabet of these races of people. In them all, but more especially in the Tartar tribes, the larynx is well developed, and is very prominent in the neck, the pomum Adami being a conspicuous feature. The vocal cords, consequently, are long and powerful, surmounted most probably by capacious ventricles. The metallic and deafening tone of the voice has been partly acquired by habit, and by partial pendency of the epiglottis, to the extent, most likely, of more or less of three-fourths. The Tartar voice, screechy and noisy, painfully affecting the ear of those unaccustomed to it, is inferior to the sonorous voice of the European; yet possessing more power and, on the whole, approaches nearer to it than that of many other nations. The extreme cold and rigour of the climate of Tartary, I think is favourable to the immunity from complete pendency of the epiglottis,

although, no doubt, many such examples may still exist among the Tartars and Mongols.

From these various accounts it is fair to argue that, in accordance with the character of their voice, the Tartars are a strong, vigorous, active, energetic, and powerful race, the worthy descendants of the great Genghis Khan, whose conquests in the thirteenth century struck terror into the surrounding nations, and which showed, moreover, what such a race of people were capable of executing. In the study of this interesting subject, nothing has commanded my admiration more than the character possessed by some of these noble Tartars, whose commanding voices were a part of their true nature.

Before proceeding to the next great kingdom, I would here remind the reader of Defoe's account of the Cochin-Chinese in the great bay of Tonquin, in *Robinson Crusoe*. Boiling hot tar was freely ladled over their naked bodies when attacking the ship undergoing repairs, which caused them to roar out like bulls. They made such a fearful howling and crying, that Crusoe compared it to the howling of wolves, for he never heard anything more nearly approach to it (pp. 384, 385, 386, of *Robinson Crusoe*).

So much space has been devoted to the two other divisions of the Asiatic nations, that I am compelled to limit my observations relatively to the inhabitants of India and Birmah. I am not going to enter into a consideration of the vocal character of the numerous tribes of India and Birmah, that would be a task in itself alone of great labour. The subject shall be noticed in reference to the inhabitants of India generally; I am indebted for some of my information to my friend Lieut. Cecil P. Stone, of H.M. 77th Regt., who has been many years in India, and who is moreover a great observer of Indian character. He replied to a series of interrogations of mine.

The chief characteristics of the voice of the natives are the following:—It is generally soft and plaintive, and very feminine. It is not so very powerful as shrill, the natives always sing in falsetto, but they can be heard at a great distance. The natives of the hills have a more robust voice than

those of the plains, and, from the habit of always calling to each other from hill to hill, have contracted a habit of loud speaking.

The hill tribes possess somewhat of a metallic twang in their voices, but those of the plains are plaintive and whining.

The natives do not possess a good speaking voice, as a general rule they do not possess voices well-calculated for oratory. They are not resonant, and never speak *ore rotundo*. As a general rule, the males possess a prominent thyroid cartilage.

There is much difference of voice in the various races of India; it may be predicated, as the variety of race, so variety of voice.

Lieut. Stone never heard a bass singer during the whole of his sojourn in India, nor even a barytone; the natives always sing falsetto. The compass of the voice is small, hardly above the octave.

In the main my observations of Indian character lead me to concur with my friend; nevertheless, I have heard good clear audible voices amongst the natives of Bengal, not unlike Europeans, more especially when they have much mixed with them. This has been observed also in the women. The slightly metallic twang varies a good deal, being sometimes almost altogether unobservable; but, as a rule, it is distinctly characteristic. In the males the thyroid cartilage is prominent, large, and deep, with fairly long vocal cords, the larynx being formed as in Europeans, but with this peculiarity, that in nearly all the natives of both sexes, particularly those I have examined in this country, the epiglottis is completely pendant, and curled under in variable proportions. I have scarcely seen a single instance of the pretty, oval, leaf-shaped epiglottis, such as we are in the habit of seeing it amongst Europeans. This pendant peculiarity must necessarily impart twang and metallic tone to some extent; and points to loss, or rather absence, of physical power and strength in the entire inhabitants of the plains. It may vary in the hill and mountain tribes, especially as they extend northwards, towards a more bracing and invigorating atmosphere on elevated lands. The natives of India are pretty

nearly on a par with the Chinese and Japanese in vocal power and compass, but they are decidedly inferior to the Tartars and Mongols.

In dwelling upon the character of the voice in the various races that inhabit the African continent, necessity compels me to confine my remarks wholly and simply to the *Negro*, as we understand by that term the various black races found in the interior and on some of the coasts, especially the western. This will permit me to take in the slaves which have been exported to the American continent and elsewhere.

Of slaves and free blacks in North America I have had many, indeed I may say abundant opportunities in the earlier part of my life of studying their peculiarities in regard to voice and speech, and their new home, so to call it, has not altered what is common to them as a race. My inspection of the interior of the living larynx, however, in the Negro, has been made in this country.

The larynx of the Negro contains all the various parts common to other races of mankind; nevertheless, as I have shown in a memoir upon the subject published in the second volume of the *Memoirs* of the Anthropological Society,* there are essential differences in the larynx of the black and white races, which necessarily exert their influence in modifying the character of the Negro voice. The Negro larynx is fairly developed, not unusually prominent in the neck, and the vocal cords are not, perhaps, of the full length of those in the European races, nor of the Tartars. Nor are they again as short as in the Chinese and Japanese. They are, probably, of intermediate proportions between the Chinese and Tartars. They differ, however, from all other races of mankind, which I have had the opportunity of examining, in these particulars: the plane of the superior surfaces of the vocal cords, instead of being horizontal, slopes from within outwards and downwards; this permits a view of the fundus and entire cavity of the ventricles of the larynx which, in their situation and position,

* Essential points of difference between the larynx of the Negro and that of the white man.

may be compared to the saddlebags placed upon the back of a mule. In the white and other races we cannot see the interior of the ventricles, because their direction is outwards, and their situation either on a level or above the plane or horizontal surface of the vocal cords. Besides these, the Negro possesses very large and prominent Wrisbergian cartilages,—little bodies, like small round peas, at the top of the back of the larynx, not commonly seen in other races of mankind.

Then, as a rule in the Negro, the epiglottis is, for the most part, pendant and curled under laterally; a condition which I have even seen in a lot of healthy young lively and laughing Negroes from the river Congo.

All these peculiarities, I think, incontestably point to the want of great vocal power, such, for example, as a loud and commanding voice. On the other hand, they possess the elements of a bellowing or roaring voice, a deafening noisy sound, without anything musical or distinctive about it, beyond mere noise. Their speaking voice varies; it is either smooth and harmonious in tone, slightly guttural, or it is rough and husky. The former predominates, and is, on the whole, agreeable and pleasing, and where it does, the Negro is a laughing low-musical and singing person. Negroes are always more disposed to be merry and laugh than to be sad and gloomy. Dull care they drive away, unless their grievances are strong and bitter. Possessing strong powers of imitation, they are in the habit of taking off other speakers, winding it up with a chuckle. Dr. James Hunt, in his essay *On the Negro's place in Nature*, says :—"There is a peculiarity in the Negro's voice by which he can always be distinguished. This peculiarity is so great that we can frequently discover traces of Negro blood when the eye is unable to detect it. No amount of education or time is likely ever to enable the Negro to speak the English language without this twang. Even his great faculty of imitation will not enable him to do this" (p. 22).

This twang is slightly nasal, but I do not think it general to the Negro as he exists in Africa. In America it has been derived by imitation from his master. In the elderly Negress the voice becomes acute and shrieking or shrill, but it is not so

in the young. Livingstone, in his work on the Zambesi (p. 551), refers to the "shrill calls of women watching their corn," and the "shrill wail of the women, O Mae" (p. 553).

And I agree with the following observation of Dr. R. Clarke to some extent:—"A pleasing manner, soft and winning ways, with a low and musical laugh, may in strict truth be declared to be the heritage of most of the Negro women" (Dr. Hunt's *Essay*, p. 22).

Livingstone says:—"The laugh of the women is brimful of mirth. It is no simpering smile, nor senseless loud guffaw; but a merry ringing laugh, the sound of which does one's heart good. One begins with Hă, Héé, then comes the chorus, in which all join, Hăéée! and they end by slapping their hands together, giving the spectator the idea of great heartiness" (p. 503). "The cries of children, in their infant sorrows, are the same in tone, at different ages, there as all over the world" (*Idem*, p. 503).

"On passing a beautiful village, called Bangwe, surrounded by shady trees, and placed in a valley among mountains, we were admiring the beauty of the situation (writes Livingstone), when some of the much-dreaded Mazitu, with their shields, ran out of the hamlet, from which we were a mile distant. They began to scream to their companions to give us chase." "The first intimation we had of the approaching Mazitu was given by the Johanna man, Zachariah, who always lagged behind, running up, screaming as if for his life" (p. 551-2). The scream here mentioned was most probably a sort of a roar or bellow, and not a shrill sound.

I never heard a fine loud sonorous voice by a Negro, although they have the power of uttering bass notes in a low and grave tone, from the peculiarities of their larynx, notably pendency of the epiglottis. The position of the ventricles of the larynx is unfavourable to intensity and gravity of sound, and to power and compass, as met with in Europeans. A barytone voice is not uncommon amongst Negro singers, and now and then falsetto voices in females, although I have recently heard of a Negro prima donna, whose voice is said to be a fine soprano. So much for the Negro voice.

It now remains for me to consider the vocal character of Europeans, and to contrast it with what has been stated concerning that of Asiatics and Africans.

Speaking generally, the natives of France and England, Germany, Russia, Italy, and other countries of Europe, possess strong, powerful, sonorous, and clear voices. There may be slight variations as to character and tone; but, as a rule, they all agree in possessing power, full compass, range, clearness, and loudness of sound. Take the Frenchman, for example, with his oratorical powers, distinctness of utterance, sonorous vibration, and audible voice, free from twang. The Italian is not inferior to the Frenchman in any respect. The Englishman, although a slower speaker, and perhaps with less fluency of language, is behind no other European nation in vocal capacity, and his voice has been heard above all others on the trying occasion of the din of battle, in commanding his fellow man; or in the senate, where his oratory, uttered in notes of distinctness and vocal power, attracts the attention of his hearers. The Russian, not unlike the Englishman in many respects, although, perhaps, with somewhat feebler vital capacity, has a voice of energy and power distinctly heard in the open air, and, in some of the districts of Russia, possessing very great power and intensity of sound. The hurrah of the Russian and the huzza of the Englishman, have been considered not unlike one another in vocal power and character. But of all the nations of Europe, there is one that carries off the palm both in power and intensity of sound, and in noisy utterance. If the metallic sound of the Tartar's voice deafens one, the continuously sonorous vibration of the running speech of the German stuns one. Whether this be owing to the peculiar guttural language, the vital capacity, or the desire to be heard above his fellow-man, I will not undertake to say; but the German has the most powerful voice in Europe. In a mixed assembly of speakers, *e. g.*, International Congress of Archaic Anthropology, the question is asked, Who is that loud speaker addressing the chair, the tones of whose voice painfully tickle the ear? Oh! the reply is made, that is Professor Sticken Mudden, of Chairhausen, a great authority on tooth-

less skulls. To the German race must be accorded the proud pre-eminence of possessing the most powerful voices amongst the various nations of Europe, and, perhaps, the French come next, although I am not disposed to acknowledge that vocal capacity and power in the Englishman is inferior to the French; this is owing, perhaps, to our climate as much as anything else, which is favourable to physical endurance, and increased vital capacity. The larynx is well developed in the nations of Europe, of full depth from before backwards, and good length of vibrating vocal cords. There is an essential absence of twang and metallic sound, which is, for the most part, due to the comparative infrequency of pendency of the epiglottis when contrasted with the natives of Asia and Africa. Amongst Englishmen, 11 per cent. is the amount of it, as given in 4,600 healthy people examined by myself;* and I do not think that the percentage in other European nations will exceed that; it may slightly do so, but future observation by other workers must determine the question. Nothing points more to the superiority of vocal character than the singing powers of a nation; and in this respect many of the European countries excel. Europe is the cradle of song, although a large cradle, if you like, but it points to superiority of voice in strength, power, compass, and sound. The details of all this the limits and nature of this paper prevent my going into. From these and other causes, therefore,—to speak in general terms,—the character of the voice is superior in the European to the Asiatic and African. He, perhaps, cannot *bellow* as loud as the Negro, nor can he screech as loud as the Tartar; nevertheless, his vocal character is superior to both. But in strength of voice he must yield to the Tartar, who, without exception, has the most powerful voice in the world. Consequently, the Tartar is physically superior to any other nation; but the various nations of Europe come next to him, even if some do not equal him, and possibly, indeed, may excel him. The Germans rank next to the Tartars. And amongst ourselves, I am disposed

* See my paper on "Vocal and other Influences upon Mankind from Pendency of the Epiglottis," p. 106.

to believe that a considerable proportion of the Irish have more powerful voices than their fellow subjects the Scotch or English. However, opinions may vary upon this point; for amongst the Celtic spoken of the Scotch and Irish, there is a similarity in this respect: their vocal power is considerable, and not unequal, which may be due to their peculiar language.

As the subject is a new one, and the field untrodden, I trust that the necessary short-comings in the treatment of it in this paper will be charitably overlooked, and harsh criticism disarmed.

XVII.—*The Fishing Indians of Vancouver's Island.* By — Bogg, Esq.

The Sougish tribe is at once the smallest and the most degraded of all the tribes in Vancouver Island. They dwell in and around Victoria, the capital of Vancouver Island, and their village is opposite that city, on the other side of the harbour. This village, like those of all the other tribes I have visited, is composed of long, low, shed-like buildings, with the front higher than the back, so as to give the roof a good pitch. The uprights of these huts are posts, firmly driven into the ground, often rudely decorated, or carved into the uncouth likeness of a gigantic human form. These posts are never taken away; but the rough-hewn planks, which form the sides and roof of the dwelling, and which are fastened to the posts by ropes of seaweed, are always carried about, by the owners, in their migrations. When the fishing season comes on, then the Indian takes down the planks, places them in his canoe, puts in, also, his baskets full of birch and bark, his collection of dried salmon-roe, and some bladders of fish-oil, and departs with his wife and family to the fishing grounds of the tribe. Adjacent to these fishing grounds is the site of the summer village of the tribe, which, for six months out of the year, is only indicated by the posts I have already alluded to. But when spring comes, with it come the fish, the salmon, the rock-cod, the skate, and shoals of herring and whiting. Then the Indians come to the village, unload their canoes, tie their planks together, fasten them to the posts, put up bunks round the sides to form their sleeping places, clear away the enormous nettle-beds, which are the constant accompaniment and sure sign of an Indian encampment; and then they settle down to the most important business of their lives, viz., to catch fish enough to last them for food till spring comes again.

It is, perhaps, in this matter of fishing that their greatest ingenuity is shown, in the numerous contrivances adopted to

obtain the end in view, and in the untiring skill which they exhibit. And here I must premise that, with regard to fishing, all the tribes are alike in the instruments they use, and the skill they exhibit. I shall, therefore, only notice other tribes when I have different customs to speak of.

When the salmon comes in season, the men of the party go out trolling in a very fast canoe, which they paddle with great rapidity. They tow a long line astern made of seaweed, very tough and strong, and to this is attached, by slips of deer-hide, an oval piece of granite, perfectly smooth, and the size and shape of a goose-egg. This piece of granite acts as a sinker, and it spins the bait. The salmon-hook is a piece of strong whalebone, at one end of which is a loop, and at the other, a piece of very hard wood, which is pointed, and lashed on to the whalebone at an acute angle. These hooks are very strong, and will hold the largest salmon. The bait is very often a red berry, of which the salmon are very fond, but at other times it is a bit of dried salmon-roe.

The cod-hook is very much more ingenious, and is made of wood, and resembles somewhat in shape an old English ℔, the upper part of the body of the letter being the hook, which, when not in use, is always kept attached to the perpendicular portion by means of twine made of fishgut, in order that it may preserve its elasticity. When the Indian goes after the cod, he takes this hook, and unwinds the twine which has kept it curved. But even when he has taken it off, the curve is still retained for a time; the bait is put on, and away he goes to the neighbourhood of some rocky islets, where the rock-cod is sure to hook; the hook dropped over the side, there this man will remain for hours, until at last he gets a bite. Then we see why the hook is elastic. As the fish tugs, he only pulls the hook out of its curve, and into a straight line; but the great force required to overcome the elasticity exhausts the fish, and makes him an easy prey to his captor. Another reason for the form of the hook, is that its breadth prevents the fish from swallowing the hook sufficiently to get at the line and bite it.

Herrings and whiting are caught in a very peculiar manner

indeed. A piece of pine, about fourteen feet long, three inches broad, and three-eighths of an inch in thickness, has one of its edges studded with very sharp spikes, made of hard wood, and about two inches long. This rake is used in the following manner. When a shoal of herrings is seen, the Indian paddles quickly up to them, drops his paddle, picks up the rake, and then, while his canoe is shooting a-head over the shoal, he makes a sweep through the shoal with his rake, his hands being the centre of the semicircle which the extremity of the rake describes in the water. He generally impales five or six fish on the spikes, which he throws into the bottom of the canoe, by striking the rake forcibly on the gunwale of the canoe.

While the men are out fishing, the squaws are employed in splitting and drying the fish, boiling down the cods' livers for the oil, drying the salmon-roe, etc. When all this work is over, and the fish are getting scarce and unfit for food, the Indian takes down his planks, stows all his gear, and departs to his winter village, where he vegetates till the returning spring rouses him again to activity.

The Cape Flattery, or Tahtoosh Indians, also pursue and capture the whale. They have a number of sealskins, which they turn inside out, and use as bladders (these, from their size, are very buoyant). They also use a large number of harpoon heads, all of which fit into one shaft. These harpoon heads are very sharp indeed, being made of old files, etc., ground down, and they are dipped in resin to prevent rust and preserve the edge. When a whale is to be caught, the canoes follow about until a harpoon can be driven into it. As soon as the whale feels the harpoon, it dives, and when it dives, the harpoon-shaft floats up to the surface and is picked up; but the head of the weapon is deeply imbedded in the whale's flesh, and attached to it is one of these large skins, or bladders, full of air. Every time the whale comes up to breathe, fresh harpoons are thrust into it, with other bladders attached, until at length the number and buoyancy of these air-vessels offers such a resistance to any attempt at diving, that the whale is soon wearied out, is killed, and then towed to the village by

the canoes. The flesh is eaten by the Indians, and the oil is used to anoint their bodies. At the principal village of the Cape Flattery tribe, the uprights of the chief's house were carved into the representation of men with their mouths open; and I saw a piece of whale's flesh *nailed* into the mouth of each figure.

The Ahousad tribe adopt another labour-saving method of catching salmon. They use a long spear, the head of which is loose, and attached by a thong to the centre of the spear-shaft. When the fish is speared, therefore, the shaft comes out of the socket in the head, and floats up to the surface, being still, however, attached to the head by the thong. Away goes the fish as fast as ever it can, dragging this fourteen feet shaft horizontally after it; but its power is soon exhausted, the resistance being so great; and the Indian, who has been quietly awaiting the result, paddles up, and takes possession of his victim.

These, then, are the methods by which the Indian takes his daily food out of the sea. Now, let us look, for a few moments, at some other of his customs. I need hardly describe the process for flattening the head, which all these tribes undergo; it has been so often and so well described, that it is perfectly familiar to all of us.

Reclined in this wind-rocked cradle, his body and limbs swathed with birch-bark bandages, the Indian child passes the first two or three years of his existence; and, perhaps, it may be a wonder to some people, but when the child is taken out of its bandages, it has the most perfect control over, and the freest use of its limbs. An Indian child is never deformed, never idiotic. The language of these tribes is most extraordinary, being, apparently, a collection of *k's* and *q's* gurgled in the throat, in a manner that would lead any uninitiated person to believe that the speaker was about to vomit. Yet to this peculiar language they can give so peculiar an utterance, that they can be heard for many miles through the silent forests. And at the time that H.M.S. *Devastation* went to the west coast of Vancouver's Island to seize some of the Indians who had murdered the Indian agent there, we subsequently

found that the exact hour of our departure from Victoria, and our destination, were known to all the west coast tribes within four hours of the time when we weighed. These things had been communicated through the forest, from one tribe to another, the distance being very much too great for any other method to have been adopted.

The Indians have several amusements. They are very fond of dancing. We had Cedar Kanim (the chief of the friendly Clayogusts) and a band of his warriors on board for some time, and one night they gave us a specimen of their dances. The old chief was in the centre of his band, holding a very formidable spear which was made of the tusk of a narwhal, and decorated with many scalps. Around him were the warriors, squatting on their haunches. One of them began beating a rude tambourine, and then all the old men began a wild monotonous chant, clapping their hands, and rocking themselves to and fro. Suddenly, with tremendous bounds, never once rising to bend their knees, but bounding in that squatting posture, the young men left the circle. A coil of rope, a fife-rail, or a hand-spike, became their enemies for the nonce, and, with stealthy bounds, and much turning and twisting, each enemy was pounced upon and scalped. Then returning to the circle they all joined in the chant, which was intended to describe the prowess of each individual, for as each was named in succession, he had to bound round the circle and back again into his place. The dance ended with them all hopping round the deck. Beside dancing, the Indians are very fond of gambling. Their game of chance is of "odd or even," and is played as follows:—They have a number of discs of wood, the size and shape of draughts. They also prepare a kind of fine bow from the inner fibre of the birch bark. When they are going to play they squat down at one end of a long piece of matting, one of the players takes an uneven number of these discs, rolls them in some of the tow, until it is like a great ball, and then suddenly divides it into two parts: the adversary has then to say which of these two parts contains the odd number. When the part is thus indicated, the player puts down the other portion, unwraps the tow and rolls the discs along the matting, the adversary counting them aloud. They will play at this simple game for days together.

They often play high, their money consisting of the Wampum beads, each of which is valued as a shilling.

When an Indian is ill the medicine man (Ooshtukl) is sent for, and as his professional education is rather different from our own, it may be as well to say in what it consists.

First, then, his mother must dream that she will give birth to a frog; and this fact is so essential that the "Doctor's" pipe and all his insignia of office must give representations of this event.

The incipient medicine man has, like those in this country, to pass a preliminary examination, only of rather a different kind, for he has to eat a live dog in the presence of the assembled tribe. This ceremony over, he retires to the woods, where he passes several days, communing with Nature, and digesting the dog. After this enforced absence, he returns to the village at noon on a certain day appointed beforehand, and the warriors arm themselves for the occasion. At noon he appears, running full speed, and his object is to bound on one of the warriors, and bite a piece out of his left breast. If he fail in his object he is slain by the warrior, if he succeed he at once rises to the dignity of a medicine man. Then he robes himself in a wolf-skin, making the head of the beast into a cap, takes his tambourine, and stalks grisly and grim to the side of his patient. There he sits, and beats the tambourine, and sings a minor chant, for days together, till his patient gets well, or dies. When an Indian dies his skull is kept by the tribe, but his body is placed in a box, together with a pipe, tobacco, (made of willow leaves), same dried fish, some fish hooks, and some money. Then the lid is tied on the box, and the box is then carried up some lofty Douglas pine, and tied on to some branches, a hundred feet or more above the ground. And there, above his forest home, above the haunts of the bear, the gaunt wolf, the stately elk, the timid deer, the aerial coffin is suspended; and oftentimes in places where Indian villages once were, but have long ceased to exist, in places where no sound breaks the gloom of the forest, where no living thing exists to lessen the awful solitude, looking upwards you may see these strange graves, may see how the Red men are placed in their last homes to await the call to the "happy hunting grounds."

XVIII.—*On the Horned Cairns of Caithness.* By Joseph Anderson, Loc. Sec. A.S.L.

A series of excavations amongst the chambered cairns of the east coast of Caithness, undertaken for the Anthropological Society of London, and jointly carried on by the writer and Mr. R. I. Shearer, has led to the discovery of an entirely new type of cairn structure, and yielded the only collection of skulls hitherto obtained from these ancient places of sepulture. In this paper, I propose briefly to describe the peculiar structural characteristics of the horned cairns, and to detail the results of the examination of their chambers.

The horned cairns, so called from the peculiar expansion of their crescentic ends into horns, or alate projections from the body of the cairn, are of two forms externally, differing only on account of the cairn-structure being, in the one class, about three times the length of the other class. Like the common, round, and chambered cairns with which they are associated, their internal structure consists of a chamber, generally divided into three compartments by monoliths, set on end in the floor, and passing through the side walls and across the area, so as to leave a passage from one compartment into the next, of about eighteen inches wide; but in their external form and structure, they differ widely from any sepulchral or chambered cairns hitherto known. The peculiar configuration of the two classes will be discerned at a glance from the accompanying diagrams (see *Mem. Soc. Anthrop.*, vol. ii, p. 226). In the typical example, a double wall, or rather, a wall built against and in front of another wall, runs entirely round the whole mass of the cairn, giving it a form not unlike that of a star-fish with four rays; while in the long cairns, the outline is the same, but triply elongated in the centre part. Within this double wall, a circular wall encloses the chamber. Of these horned cairns, we have explored five examples, all in the parish of Wick.

Three of them are long cairns. No. 1 is 240 feet in length,

the breadth of the base of the body of the cairn, at the wide end, being 66 feet, and at the narrow end, 36 feet; the expansion of the horns, in the wide end, being 92 feet from tip to tip, and at the narrow end 53 feet.

No. 2 is 195 feet long. Its horns are shorter, but well defined; and the expansion across the tips, at the wider end, is 64 feet, and across the smaller end, 32 feet.

No. 3 is 190 feet long, the base of the body of the cairn being 43 feet wide at the broad end, and 26 feet at the narrow end; and the expansion of the horns 62 feet at the wide end, and 34 feet at the other.

These three long cairns all have their highest and widest ends facing eastwards, No. 1 looking E. by S. by compass. No. 2, N.E.; and No. 3, E.S.E. In this feature, these long cairns resemble the "long barrows" of the south of England; and some of the Yorkshire long barrows, also, appear to have had a "retaining wall" exterior to the mass of the cairn, though in their horned structure the Caithness long cairns stand alone.

In two of the long cairns, the chamber is situated in the east, or highest end, the rest of the cairn being simply a mass of rubble. The passage, in these two instances, opens in the middle of the curvature between the horns. In the third case, the chamber opens to the side of the cairn, and there is no passage opening between the curvature of the horns.

The horns of No. 1, taper from a breadth of about twenty feet, where they spring from the front of the cairn, to nine feet at the tips; and the curvature—from the entrance passage in the centre to the tip of the horn—is fifty-four feet. In No. 2, the horns do not project more than five feet, and they are only six feet broad at the tips. In No. 3, the line of the curvature, from the opening of the passage in the centre to the tips of the horns, is thirty feet, and they are ten feet wide at the tips. These singular prolongations of the structure contain neither chambers nor cists, and are built upon undisturbed clay. Their height varied according to the preservation of the cairn. In No. 1, one horn was imperfect. In No. 2, all four are perfect on the foundation, the tips being about a foot high

above the surface of the moor, and the double wall rising from thence to a height of about seven feet in the centre of the curvature. In No. 3, the highest part of the double wall, in the centre of the curvature, is five feet.

The chamber in No. 1 is entered by a passage ten feet long and about two feet wide. The chamber itself is about twelve feet by six, and of the height of the walls about six feet remain, with signs of convergence by overlapping stones, at that height, to form a flattish dome-like roof. It is divided into three compartments; the divisional stones, single slabs, standing about seven feet high between the first and second compartments. The third compartment is a recess in the end, with a doorway two feet four inches high, and twenty inches wide. The whole recess is roofed by one enormous block of stone, supported in front on the two divisional slabs. The area of its floor is only four feet eight inches by two feet four inches, and the interior height two feet and a half.

In the long cairn, No. 2, we found two chambers, with indications of others, opening to the south-east side of the cairn instead of to the end, as in the others. One of these chambers was of the usual tricamerated kind, and the passage leading into it was partly vaulted by overlapping stones, and partly lintelled with large flat blocks. The other chamber was a simple beehive-shaped cell, about four feet by five, and six feet and a half high in the centre, the walls converging from the height of four feet. It was reached by a winding passage twenty-three feet long, and not over two feet and a half high.

In No. 3, the chamber was in the eastern end, and was large and roomy. Instead of having a small compartment at the back, the third division of the chamber expanded into a semicircular area, making the whole chamber eighteen feet in its greatest length, and eight feet in its greatest breadth.

The two short cairns are pretty nearly of a size; the body of the cairn, in each case, measuring about forty feet by fifty, and the extreme length of the structure, including the horns, being in the one case eighty feet, and in the other, sixty-six. In the one, No. 4, the horns extend forward about twenty feet, and backward about sixteen feet from the body of the

cairn, and they taper from about eighteen feet at the widest, to about six feet at the tips. In the other, No. 5, they extend forward about twenty feet, and backward about fifteen feet, tapering to a breadth of eight feet in the front tips, and nine feet in those behind. In No. 5, the best preserved of the two, the double wall forming the outline of the body of the cairn and horns, is nowhere less than two feet high. The circular wall surrounding the chamber is about four feet high. How much higher these walls may have been, there is nothing to show.

The chamber floors in both the long and the short cairns yielded abundant evidences of cremation, as well as of the deposit of unburned bodies; but while the quantity of the remains found in the long cairns was scanty, in the short cairns it was very large. Manufactured relics were also much more plentifully found in the short than in the long cairns. In both the long and the short cairns, the occurrence of unburnt bones in greater or less abundance on the surface of the floor; while the floor itself was composed of a bed of ashes mixed with burnt bones of human beings, and half-burned, broken, and splintered bones of animals, suggests the idea that cremation was the earlier mode of sepulture in these cairns. In one instance, however, in the long cairn No. 3, a cist of the short kind was found set on the floor, evidently a secondary sepulture to the cairn chamber, and in the cist were an urn, ornamented with the twisted thong, and scattered about it seventy beads of lignite, formed like vertical sections of the shank of a tobacco-pipe, varying from an eighth to nearly a quarter of an inch in length. On the same floor with the cist were a quantity of human bones, unburnt. While the floors of the chambers in the long cairns were a mixture of clay, ashes, and bone fragments, the floors of the short cairns were almost entirely ashes and bones, forming a layer from a foot to a foot and a half thick.

No. 1 of the long cairns yielded, to a minute search of the substance of the chamber floor, a few flint chips, and a peculiarly shaped flint like a flat truncated cone, the sides of which were formed by a number of narrow facets struck off longitudi-

nally. The length did not exceed half an inch and the diameter of the base considerably less. An almost exactly similar worked flint was found in excavating a broch close by. The bones in this cairn were extremely comminuted, being broken into splinters the largest of which was not above an inch in length. Two fragments of pottery, well burnt and plain, completed the list of objects found in No. 1.

No. 2 of the long cairns yielded even less. A single flint chip, and a few bones human and animal, were all the relics found in the floors of the two chambers.

No. 3, besides the cist already mentioned as set on the floor, and containing an urn and heads of lignite, yielded a considerable quantity of human bones, burnt when found imbedded in the floor and unburnt on the surface of the floor. Mixed with the human bones were a quantity of animal bones broken and splintered.

The short cairn (No. 5) at Ormiegill yielded an immense quantity of broken and burnt bones human and animal, the animal bones being those of the horse, ox, deer, dog, and sheep or goat. In many instances the human bones were burnt to charcoal, and the animal bones were all splintered. From the quantity of fragments of human skulls a number of all ages must have been deposited in the chamber.

In one compartment we found a beautifully polished hammer of grey granite, perforated for the handle, a triangular flint arrowhead, and a broken knife of flint beautifully worked and ground sharp along the cutting edge. A large quantity of flint chips, some of which had been worked for arrow heads but left unfinished, were found and also a disc of flint about an inch across with facets taken out of its edges all round so as to make it a section of a cone parallel to the base. In the first compartment another triangular arrow-head was found. A large quantity of fragments of pottery was picked out of the debris of the floor. Some of it was thin and well made, but none wheel-made. The pottery though all plain was of three or four different patterns, distinguishable by variety in the lip or the thickness of the fabric.

The other short cairn (No. 4) called the cairn of Get yielded a series of six or seven skulls, of which three or four were pretty entire. They lay in the first compartment, on the right side of the entrance, and the bodies appeared to have been laid across the doorway with the heads all to the E.S.E. The quantity of bones in the floor of this chamber was something surprising, and while those imbedded in the floor both human and animal were generally burnt, some being burnt only at one end, none of the human bones lying on the surface of the floor were burnt.

The layer of ashes and burnt bones forming the substance of the floor was in this cairn fully eighteen inches thick. Scattered through it were a great quantity of flint-chips, some burnt white, others untouched by fire. One very neatly shaped arrow head like a small rose leaf was picked up in the principal compartment. The pottery of this cairn presented a greater variety of ornament than in any of the other horned cairns. The pattern found in the common round cairns ornamented by indenting the wet clay with the finger nail occurred in this cairn. The same pattern has been found in the broch.

Whether the reason or object of the tri-camerated arrangement of the chambered cairns be symbolic or simply constructive is not apparent either from their structure or contents. Still less apparent is the reason or purpose of the peculiar design exhibited in the external configuration of the structure of these horned cairns. It is as yet an open question upon which no evidence is attainable whether these peculiarities of external structure, the horned outline and double wall giving each of the four sides a kind of crescentic form are part of the cairn as originally constructed, or later additions; but from the analogy of the round cairns, which are encircled externally by a double wall, it seems probable that the crescentic outlines, formed by the double wall of the horned cairns, is the original design of the cairn form.

That they were used for two different modes of sepulture at different periods, and possibly by different races, seems plain from the abounding evidences of cremation in the floor, and the occurrence of unburned skeletons at full length (so far as we

have no distinct evidence c
Difficult as it is now-a-days to realise an
immense amount of labour implied in g
such an enormous mass of stones as that o
240 feet in length by forty-five of avera
rently six to eight feet of average height
wards of one thousand cubic yards of st
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relics are mortuary and not domestic, an
honour and perpetuate the memory of the m
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It has been suggested that while the broch
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were the rearers of both these classes of anci
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that the design of the habitation was forced
perience as the fittest for defence; while t
like the primeval idea of all tombs, as s
have been copied from a more ancient st
may have been

ends looking eastward, and the chamber constructed in the eastern end, and both having a retaining external wall, although this has been noticed only along the side of some of those in England, seems to point to a community of origin, while the general affinity of the chambered cairns of Caithness with those of Ireland is equally suggestive. But until a better and more extensive series of crania from these sepulchral monuments has been obtained for comparison, the question of race must remain in abeyance.

XIX.—*Anthropological Remarks on the Population of Venezuela.*

By A. Ernst, of Carácas, F.A.S.L.

I.—Statistical Inquiries.

It is entirely impossible to say what is the exact number of inhabitants in Venezuela. The dates contained in geographical works are merely founded on general calculations, and are not the results of careful numbering. A trustworthy census has never been made, and is altogether an impossibility, much people living far from villages or other communities; and even in these, a considerable number of inhabitants would abscond, because they consider a census identical with researches after people for military service.

But there exist official statistical evaluations of the number of inhabitants. They are made from time to time to regulate the elections for the Congress; but their results are very suspicious. The persons who have to number receive, for each hundred of inhabitants, a certain remuneration, and it is therefore their interest to get a final number as high as possible. Nothing at all can be stated with respect to the independent Indian tribes. Humboldt calculated, at the beginning of this century, 800,000 inhabitants, fifteen per cent. of which were pure Indians, eight per cent. Negro slaves, twenty-five per cent. Hispano-Americans, one per cent. Europeans, and fifty-one mixed races. A. Codazzi (*Resumen de la Geografia de Venezuela*, Paris, 1841) gives, for 1825, 701,633 inhabitants. The decrease may be accounted for by considering the long war of independence, and the most cruel manner of warfare on both sides, the dreadful earthquake of 1812, and the epidemics in 1818 and 1825.

In 1839, according to the same author, the population was 945,348, represented as follows:—

Independent Indians	52,415
Half-civilised Indians	14,000
Completely civilised Indians	155,000
White Hispano-Americans and Europeans	260,000
Mixed races	414,151
Slaves	49,151
Total	945,348

This number would give a yearly increase of more than two per cent. for the fourteen years from 1825 to 1839; whilst even the United States, for the ten years from 1850 to 1860, show but a yearly increase of 1·8 per cent. (Klöden, *Erdkunde*, iii, 731), and England and Wales, for the twenty years from 1831 to 1851, nearly 1·3 per cent. (Klöden, *loc. cit.* ii, 539). It may be stated here that the work of Codazzi is not at all very exact and sincere in its statistical part. The author had a purpose very different from what the book pretended to be written for, "to draw, with the hand of an apparently learned man, a veil over the true situation of the policy and economy of Venezuela, covering over all what was foul, and representing things neither as they were then, nor are to-day. It was not convenient to say that poor Venezuela had already made a powerful beginning in the abominable corruption, which, at last, led to scandal and ruin" (William Iribarren, in a letter, dated Bogotá, 21st Nov. 1847, communicated in M. de Briceño, "La Gran Cuestion fiscal de Venezuela, Caracas," 1864).

The following census of 1844 gives the following results:—

Free Inhabitants	1,173,574
Manumisos*	23,514
Slaves	21,628
Total	1,218,716

This is the most trustworthy census made in Venezuela. Dr. M. de Briceño, in the very able paper mentioned before, starts, therefore, in his calculations of the population from this number, by adding, from year to year, the excess of the births over the deaths, and arrives, for 1863, to 1,700,000 inhabitants, which gives 1·7 per cent. increase per annum. But this excess is not known with full security. It was in 1843 ("Memoria de lo Interior y Justicia," Caracas, 1844), 28,223, the number of births being 50,121; the number of deaths, 21,898; so that there was one birth for 24·6 inhabitants, and one death for 43·2 inhabitants (Peuchet gives for France, on 28·3 inhabitants, one birth, and on 30·9, one death). The number of deaths, nevertheless, was certainly greater. We must con-

* These Manumisos were in a transitory state from slavery to emancipation.

sider that in such a country as Venezuela, many persons die without being noticed by anyone, even in Caracas. More, the number of dead-born children is contained in the number of births, but not in that of the deaths, so that the excess will be considerably reduced.

In Caracas, with 50,000 inhabitants, was the average number of deaths per week in 1864, 25, or nearly 2·5 per cent. per annum. Caracas is certainly, generally spoken, a healthy place, and in case of sickness, medical assistance can be procured immediately. This is not so in most parts of the country; and it will not be too far from truth when 2·5 per cent. are taken for the whole country, which gives one death for forty inhabitants.

Considering, finally, the repeated civil wars of this country, the epidemics, the notorious unhealthy condition of many parts, and some reasons I shall expose hereafter, I think one per cent. might be the maximum of the yearly increase, so that, adopting the result of the census of 1844, we get nearly 1,500,000 inhabitants for 1864. This per centage of but one per cent. is, in contradiction to a statement made by Humboldt (*Essai pol. sur le royaume d. l. Nouv. Esp. éd. in* 8., i, 337), "On observe partout sur le globe que la population augmente avec une prodigieuse rapidité dans des pays qui sont encore peu habités, sur un sol éminemment fertile, sous l'influence d'un climat doux et d'une température égale, et surtout dans une race d'hommes robustes et que la nature appelle très-jeunes au mariage."

Venezuela certainly has a great number of the conditions mentioned in these lines, and Humboldt is right in saying that there exists precocity in both sexes; he might even have added, that a birth comes very often before the marriage. There are families with a great many children; I know a man who has nineteen from the same mother. But these are exceptions, and the progression comes very soon to a standstill. Amongst the aristocratic classes of the white Creoles, the young men ruin themselves by sexual dissipations, and become old before the time. The daughters—and there are generally more daughters than sons—remain very often unmarried ("quedarse por tia",

remain as an aunt, say the Spaniards); and even in case of a marriage, they do not become mothers of a numerous and healthy family. In all classes, boys and girls are infested with the vice of onanism. They learn it already, in the very beginning of life, from their wet nurses, generally low mulatto-women, and many other reasons help to foster the vice; so the young people grow, by and by, to everything but "une race d'hommes robustes," and miscarriages and dead-born children are very numerous. Amongst the lower classes, many children die for want of assistance; nay, a considerable number are directly killed. The law is blind and deaf; the little creatures become angels, "angelitos," and the unnatural mother gets very easily the "ego te absolvo" of a priest, when she confesses her deed. It is almost incredible what a corruption reigns amongst this part of the population. The interior of the country is, of course, still worse than Caracas; idleness, drinking, and prostitution is all what fills their miserable existence. In the beautiful and rich valley of Aragua, I have seen mothers who offered their own daughters, girls of ten or eleven years, in the most shameless manner, for a couple of glasses of gin! Amongst eight hundred and eighty-six sick persons, who entered, in 1864, in the hospital "militar," were one hundred and sixty-five, or nearly nineteen per cent., syphilitic; and the druggists sell large quantities of all kinds of remedies, recommended as "especifics" against this sickness. Under such circumstances, a considerable increase of the population is impossible, and one per cent. will, perhaps, be too high a rate, but certainly not too low.

We are inclined to overvalue the population of American countries before the time of the conquest; nevertheless, in Venezuela, I believe it to have been greater than to-day. Caulin (*Historia de la Nueva Andalucia*) mentions thirty-nine missions, with 30,000 Indians ("Indios reducidos"), and says that more than ten times as many were not yet established in villages. Supposing, therefore, only 300,000 inhabitants for the territory called then Nueva Andalucia, we would have, in the whole country, from two to three millions.

The 50,121 births of the year 1843, were 25,520 males and

24,601 females. This result is exceptional, as generally there are more women than men. This total population contained 599,647 of the latter, and 619,469 of the former, showing the proportion of 100 : 103·3. The two provinces, Apure and Maracaybo, nevertheless, make an exception; the proportion of the males to the females, in the first part, was 100 : 87; in the second, 100 : 83. The maximum was in Coro, 100 : 112·1, and in Guyana, 100 : 113·4.

A memoir of the "Comision de Instruccion pública," 1844, gives the number of children, of five to fourteen years, 262,622, corresponding to a population of 1,083,239 (two provinces were not included), or 24·2 per cent.

II.—Different Races.

The constitutive elements of the population of Venezuela are foreigners, white Creoles, mixed races, Indian tribes. I omit the Negroes. In 1845, Venezuela had but 21,000 slaves, and we may suppose 10 per cent. were pure Africans, as the importation of Negroes was already prohibited in the first constitution of the Republic. It is obvious that to-day their number must be reduced that it may be allowed to neglect them completely. Venezuela had never many Negroes. They formed in 1839 only five per cent. of the total population (Cuba, in 1846, 36 per cent.; Dutch Guyana, 1858, 71 per cent., Klöden, *Erdkunde*, iii, 663, 654). Slaves were principally kept in the agricultural districts near the coast, in the valleys of Tuy and Aragua, and in the province of Carabobo. In the other parts, there were scarcely any (Apure, 1844, seventy-seven slaves; Guyana, 1844, one hundred and forty-four slaves), and even Mulattoes are very rare.

Amongst the foreigners are the Isleños, from the Canary Islands, the most numerous. This immigration brought from 1832 to 1844, 11,687 inhabitants; to-day we may suppose three times as many. These Isleños are very industrious and active. An Isleño begins generally his career by selling "malojo" (zea mais L., the green plants of which are cut when in bloom, and used as fodder for horses and other animals). By this lucrative business and his extraordinary, even stingy, eco-

nomy, he gathers money, and by and by sets up a "puelpería", a small shop containing whatever belongs to the daily necessities of common people. Many of them have become very wealthy; and some are now at the head of large commercial establishments, although they are scarcely able to write their names.

The second in number are the Germans. It is a well-known fact that the commerce of Venezuela is principally done by German houses. The most important places are Laguayra, Caracas, Porto Cabello, Maracaybo, and Ciudad Bolivar; but none of them is a first-rate market, so that commercial houses that are only in relations with one country, cannot do much. A Venezuelan house must therefore work with many different countries; it must have export and import together, and this kind of business is, for instance, not for an Englishman. He will do excellent business where he has to deal only in English articles; in Venezuela, the English houses do not prosper. The Germans have a kind of universality, and they thrive, therefore, here very well. The German colony Tovar, however, is a complete failure. France is represented by several hundred of her children, many of them are merchants, or, as in Caracas generally, bakers, tailors, and shoemakers. Next to them come the sons of the old Roma. The greatest number occupy themselves in mending tin-ware, going from house to house with their particular "nada di componer?" (nothing to mend?). Venezuela has but few North Americans, although there is much commerce with Philadelphia. Still less is the number of Englishmen; but there exist other relations between England and Venezuela, and Messrs. Baring Brothers can tell more about it.

There are not 1,000 families of pure white Creoles in the country. They belong generally to the actually vanquished aristocratic party, styled by the people "Godos", with reference to their Spanish origin; or, "Mantuanos", because they only had formerly the permission to go to church dressed in a long cloak, or "manto". I may be dispensed with characterising them by referring to Tschudi's excellent description of the white Creoles in Lima, (*Travels in Peru*, American edit., p. 65). C'est tout comme chez nous.

The census of Venezuela gives no information at all concerning the number of inhabitants belonging to the mixed races. All are "ciudadanos", and a difference of races does not exist before the law; it would even be dangerous to speak about it in the public papers, and much more so to-day. But this difference does exist in society, and will, perhaps, never disappear completely. We have all the *nuances* from the deepest black to the almost perfect white, so that the colour is no good criterion. More security is in the hair, the colour of the nails, which are always much darker than their bluish-white lunula, and the dark colour of the sexual organs in coloured men.

The son of a white father and a negro mother is called "Mulatto"; the son of a white father and an Indian mother "Zambo". When a man of mixed blood marries a woman darker than himself, and his children thereby become further removed from the white tint, it is said to be "un salto atras" (a leap backwards).

The mixed races are actually the ruling part of the population, and will be for a long time. Their intellectual and moral abilities and disabilities will form the object of another communication, which I shall have the honour to lay before the Society, as soon as I find leisure to write it.

Anthropological Communications from Caracas.

III.—The Mixed Races.

There has been said already so much about the intellectual and moral disabilities or abilities of mixed races, that it is perhaps quite impossible to bring forward anything new. Nevertheless, I cannot help thinking that contributions towards the final settlement of this question, from whatever quarter they may come, are not entirely superfluous; for here, as in natural history in general, the ruling laws can only be discovered by a careful gathering and critical study of a vast number of facts.

The name "gente de color" or "café con leche" is in Venezuela only given to the Mulattoes and Zambas. The offspring of the white and Indian races, the mestizo, " is even in social

life considered as a pure white man. And very little he differs from the white European, as for more than a century back the greatest number of mestizo-families had no opportunity to mix with individuals belonging to the pure Indian tribes.

The mixed races in Venezuela are of very different character in the larger towns and in the country, and it is therefore absolutely necessary to distinguish two classes with regard to intellectual or moral conditions. There are two causes in towns which have a raising influence on the lower mixed classes; the more or less greater difficulty of earning the daily bread, and the surrounding atmosphere of business and industry. In the country the poorest man may satisfy his hunger very easily; nature furnishes a large number of edible fruits, growing almost without any care whatever, and considered as every one's property; the mildness of the climate reduces the articles of dress to a minimum, and an habitation is very easily procured, when after all wanted. The town people are not so favoured, or, I should like to say, they are indeed more favoured, being obliged to work at least something, in order to meet the necessities of their existence. It is natural that the quantity of work they do, falls short when compared with the work of an English or German journeyman; but they do generally more than the individuals of the pure white race, foreigners excepted. There is a good portion of laziness in their character, but they cannot keep back entirely in the industrial movement which surrounds them. People of mixed blood are, therefore, met with in all the different classes of our metropolitan society. In military and bureaucratical circles they are actually in the majority. It is well known that Venezuela, or as the country in official papers is called "Los Estados Unidos de la Federacion Venezolana," enjoys now an entirely and thoroughly democratic government, but the "demos" in this country is of mixed blood. Military and civil service, too, are not very troublesome with us; a considerable stock of knowledge is not wanted, the duties of service leave a good many hours for smoking paper-segars or loitering about the streets, and for all this hard work a comparatively high salary is paid. *Memoria de Guerra y Marina*, for 1865, a kind of blue-book, mentions, "27 generales en jefe,

42 generales de divisios, 75 generales de brigada, 89 coroneles, 53 primeros comandantes, 34 segundos comandantes, 67 capitanes, 35 tenientes," and a few more simple soldiers, who receive together nearly £100,000 pension a year; and the number of generals, colonels, and commanders in service is nearly as large. I do not think that France and England together have to provide for so many generals and high officers.

In the time of the Spanish government the priests belonged all to the principal families of the country, and it was quite sufficient to distinguish a family by saying that one of its members was a man in holy orders. This is now-a-days very different. The clergy is, *generally* spoken, far from being a worthy community, recruiting itself from the very scum and rubbish of the people, so that the limited number of excellent and truly venerable priests—I mention first of all the present Archbishop Silvester—is diminishing very rapidly.

There are many lawyers and physicians belonging to the mixed races. One of the first, a Zambo, is a man of really eminent talent, who conducted for several years in a most distinguished manner the financial affairs of his country.

The greatest number of the smaller shop-keepers, tradesmen, masons, carpenters, barbers, sailors, are mulattoes or zambos; and servants, nearly without any exception, belong to the same classes.

So it might seem that the mixing of races did not produce a depravation of the intellectual faculties. Nevertheless, observed more closely, it will be discovered that this apparent progress is but an exterior varnish, the result of the remarkably high *imitative* faculties of races mixed with African blood. They have a certain amount of skill in reproducing whatever they see; but are, generally speaking, neither able nor fond of finding out something new. It is, for instance, exceedingly difficult to persuade a workman to change a little his routine; he cannot accommodate his work to the peculiar conditions of a given case. A mason begins a building without making any plan, or calculation, and often he makes first the wall and breaks out afterwards the windows. The great musical talent of the

people is another proof of their imitativeness; I know a mulatto who acts, sings, and whistles a whole opera, after having heard it three or four times, and there are many instances of men and women who play pretty well on a piano without having got any musical instruction. But here the matter stops. We have no original musical inventions, except some trifling dances, not even a refined taste for music.

It is not better in the scientific studies. When I came first in this country, and began my practical work as a teacher, I was astonished with what I saw of the methods of teaching in different colleges. A text book is adopted, without much care in the choice, and very often a choice is impossible, as some text-books are unique; this book is simply learned by heart, very often without any explanation. And hard things have the poor boys to get into their heads, as a great many Spanish school-books are written in the most confused and unintelligible manner; I have seen young men who had passed in this way through a dozen of volumes on mathematics and physics, being not very little proud of their studies, and who were nevertheless utterly unable to calculate a simple equation of the first degree, or to say where the centre of gravity is in a simple pair of scales: "These things had not been in the book!" but they were immediately ready to define what is universe, "la síntesis de la voluntad de Dios" (the synthesis of the will of God).* I tried to give my lessons in a more rational method, and, although the number of my coloured pupils is very limited (a school establishment would not prosper when admitting pupils *de color*), I must say that I did not succeed in the abstract objects of instruction, and I feel sometimes very disappointed when I remember my pedagogical experiences in my own country. I always obtained more satisfactory results in languages, writing, drawing—in short, in those branches where imitation prevails. It is therefore for me an unquestionable fact that *the mixed races, in their intellectual condition, are cha-*

* Ibarra, Alej., *Manual de Física*, Caracas. The quoted definition is at the beginning of the introduction. The author is professor of physics in the university.

racterised by a considerable degree of receptivity, whilst their free creating faculties are much less developed. Far more so is this the case with country people; they are neither instigated by necessity, nor pushed on by a surrounding industry, and as they never put their intellect in action, unless for some naughty deeds, they lose it by and by entirely. It is true nothing is done for their education, but, I am sure, even in the case that they had the opportunity to instruct themselves, they would not do it. Their head is full of the absurdest superstition, so much more as their priests generally are just as civilised as the flock is. A sketch of the moral conditions of our mixed races will also have very deep shadows; sensuality, luxury, and idleness, are the sources of all domestic and public misery in this country. The mulatto is much less fond of drinking than many northern nations are; but his sexual dissipations come very near to brutality. Onanism and prostitution are things most common; venereal diseases of all kinds and forms are met with throughout the whole country, and in all classes of society; their consequences being so much more fatal as generally but little care is taken in curing them.

The great inclination for luxury leads very naturally to many dishonest manners for gaining the means of procuring it. Gambling is one of the most common vices; even boys play in the streets "cara y sello" (head or tail) with copper cents; this vice found fresh nourishment in the newly established weekly lotteries, which in one year, in Caracas alone, represented a sum upwards of £150,000; a single number is divided in fifths, and costs two shillings, so that the seduction is calculated even for the poorest classes. The actual government has given the very interesting declaration that, "lotteries are an industry as anything else," which will be a startling discovery to students of political economy.

There will be a long discussion about the last horrible events in Jamaica. Enthusiastic "know-nothings" will certainly represent the "poor black brethren" as sufferers and martyrs; there may be some injustice, the world is nowhere perfect; but should Venezuela one day be in a similar case as Jamaica to-day (Heaven forbid!), it would be utterly impossible

to say one word in favour of the black or coloured people. There is plenty of work and very high wages are paid; even in the very neighbourhood of the towns hands are wanted, not only in the time of the crop, but throughout the whole year. Near Caracas two shillings and six pence and three shillings are the general term of daily wages; a friend of mine paid even six and seven shillings during the sugar crop, and he could scarcely find people. A field-labourer, or "peon," leaves very often the estate where he lives under the most ridiculous pretext, and the owner is in a very disagreeable dependency from his people. The domestic service is so bad that it is nearly intolerable. The ideas of independence and sovereign citizenship produce an impudence and laziness unknown amongst the serving class in Europe, and there is no law to regulate these matters. Here is a nice problem for Mr. Ruskin! Venezuela is very thinly populated. There is in Codazzi's excellent Atlas of Venezuela a map, where the most cultivated parts of the country are marked with red colour; but these are disappearing small spots in the vast extent of the republic. So Indian corn, our principal bread fruit, is not cultivated sufficiently so as to meet the home consume, and large quantities must be imported from the United States. It is therefore not the want of labour that makes our labouring classes miserable; it is the want of activity and industry.

And what means religion with this people? They are just as superstitious as the fetish-adorers in Africa; the only difference is that they have not the same fetishes. Fear only instigates them to perform religious ceremonies, not thankfulness; when a week since Caracas was threatened by a repetition of the awful catastrophe of 1812, a great many people ran to get married after having cohabited with each other for many years. Their religious feasts are disgusting comedies. After a very moderate computation it is supposed that in Caracas nearly £4000 are spent every year for rockets, which form the most important part of those festivities. "In ordinary years the value of the fireworks purchased by, and for the public amounts to from £15,000 to £20,000, which rises to £25,000 in a coronation year" (*Chemical Technology*, by Th. Richardson and H. Watts,

reader, 6 May, 1865, p. 510); this is in England, with a population of nearly thirty millions; so that Caracas (fifty thousand inhabitants) spends one hundred and fifty times as much in this respect.

The statistical documents, published by the ministry of justice every year, contain some dates referring to the number of crimes; but they say nothing about the different races. A very large portion of the population having mixed blood, we shall not be very far from truth by taking the given numbers as characteristic for the state of legal morality amongst the mixed classes. The year 1844 was a very peaceful one, and President Soublette was desirous to maintain all in the best order; we may, therefore, suppose that no extraordinary crimes were committed, and that justice had full opportunity to lay hands on the perpetrators. 1451 persons were put to trial, 1350 men and 101 women, which gives 1 for 675 inhabitants; 662 men and 29 women were sentenced. Amongst the remarkable crimes I mention—484 cases for inflicting wounds, 82 cases of murder, 278 cases of theft and robbery, 11 cases of incest (six men and five women, four of these from the province of Mérida), etc. 518 individuals were field-labourers, 374 journeymen, 77 tradesmen; 1051 (76 per cent.) had no instruction whatever, 306 could read and write, and but 34 had a more advanced instruction. The province of Maracaibo has the maximum (1·319), that of Caracas the minimum (1·1142).

In 1856, 1529 persons were brought before the tribunals for crimes, 1437 (94 per cent.) men and 92 (6 per cent.) women; 689 were sentenced (664 men, 25 women); 425 were field-labourers, 520 journeymen; 1149 (78 per cent.) were totally uneducated, 316 could read and write, 18 had a somewhat higher education. The province of Maracaibo had again the maximum (1·374), the island of Margarita the minimum (1·1340). Nineteen of the ninety-two accused women were from Mérida; general proportion 1·797.

These numbers are too low, and the reason is simple: justice is here, more than elsewhere, a blind goddess, and the public conscience is far from being very delicate. So it is in private life; but the same observation holds good in the public affairs *of this country*. I will not give any proofs of my own, but

transcribe two passages of the "Proclamas de Simon Bolivar, libertador de Colombia," New York, 1853, which I hope will be a quite sufficient illustration :—

"There is no faith in America, neither between individuals nor between nations. Treaties are papers, constitutions books, elections combats, freedom is anarchy, and life a torment. This is, Americans, our deplorable situation; if we do not change it it would be better to die!"—(From a paper published in Cuenca, under the title "Una mirada hacia la América española" (a glimpse on Spanish America) 1828.

And on the 9th of November, 1830, thirty-eight days before his death, the same remarkable man spoke the following prophetic words :—

"America is not to govern. Those who have served the revolution have ploughed the sea. The only thing which can be done in America is to emigrate; these countries will fall, without fail, into the hands of the unbridled multitude, and pass then into those of petty tyrants, almost imperceptibly, of all colours and races, raising themselves by crimes and extinguished by ferocity. The Europeans, perhaps, will not deign themselves to conquer them. If it were possible that a part of the world could fall back into the primitive chaos, such would be America's last period."

Here is the original Spanish text of these two interesting quotations :—

1. "No hay buena fé en América, ni entre los hombres, ni entre las naciones. Los tratados son papeles, las constituciones libros, las elecciones combates, la libertad anarquia y la vida un tormento. Esta es, Americanos, nuestra deplorable situacion; si no la variamos, mijor es la muerte."

2. "La América es ingobernable. Los que han servido á la revolucion han arado en el mar. La única cosa que se puede haver en América es emigrar. Estos paises caerán infaliblemente en manos de la multitud desenfrenade, para despues pasar à las de tiranuelos, casi imperceptibles, de todos colores y rajas, devorados por todos los crimenes y estringuidos por la ferocidad. Los Europeos, tal vez, no se dignarán conquistarlos. Si fuera posible que una parte del mundo volviera al cáos primitivo, est seria el último periodor de la América."

XX.—*Examination of Central American Hieroglyphs: Of Yucatan—including the Dresden Codex, the Guatémalien of Paris, and the Troano of Madrid; the Hieroglyphs of Palenqué, Copan, Nicaragua, Veraguas, and New Granada; by the recently discovered Maya Alphabet.* By WILLIAM BOLLAERT, F.A.S.L., F.R.G.S., Hon. Sec. A.S.L., Corr. Mem. University of Chile, of the Ethnological Societies of London and New York, etc.

IN the second volume of the *Memoirs of the Anthropological Society of London*, 1865-6, will be found my paper on the recently-discovered Maya alphabet of Yucatan, by B. de Bourbourg.

Repeating, with Humboldt, that an alphabet is one of the most interesting and beautiful inventions; what ages must have elapsed before the red men of the New World could have raised themselves to decompose words, the analysis of sounds—the invention of an alphabet.

I was anxious this discovery should have immediate publicity in this country, and the Council of the Anthropological Society permitted my paper to be printed in anticipation of the publication of the second volume of *Memoirs*, for distribution at the Birmingham Meeting of the British Association.

The first region referred to is the Peninsula of Yucatan, between 18° and 21° N. and 87° and 91° W., with its wonderful stone ruins, of pyramids with temples on their summits, palaces, and other large buildings. To the south-west, in the State of Chiapa, are the beautiful Palenqué monuments. Guatemala is covered with undescribed ruins. We then arrive at Honduras, in which, with other remains, are the statuary and hieroglyphic monoliths of Copan; lastly to Nicaragua, Veraguas, and New Granada.

It is still a question whether the civilisation of Central America came from Mexico, or that, long before the times of the Montezumas, Mexico may not have been beholden to Central

America. But as facts are steadily brought together in connection with those countries, the time may not be far distant when we may be enabled to decide whether the Toltecs, or even an earlier people of the red man in Mexican history took a civilisation into Central America, or that the latter region had had its own for ages.

In the northern portion of Yucatan, at an early date, existed the kingdom of Mayapan in particular; and in what may be called the Maya region there is evidence by ruins of the existence of numerous cities built at various periods, including Mayapan, the Memphis of Central America; then follow Uxmal, Kabah, Chichen, Izmal, and many others. There is the enigmatic empire of Xibalba, which appears to have included that large tract stretching from Tobasco on the Gulf of Mexico to the Gulf of Honduras, taking in a portion of what we now know as Guatemala. Palenqué, the Thebes of America, may have been the capital of Xibalba; there was also the considerable Quiché kingdom in Guatemala, which had Utitlan as its capital. Then followed the powerful states of Copan, in the proximity of Honduras, the countries of Nicaragua, and Veraguas.

The style of building, modes of ornamentation, and the other matters connected with the regions adverted to, are most peculiar, and cannot to my mind be classed with any of the architecture or modes of thought of what we call the old world.

Seeing that there was an empire, kingdoms, and independent states in Central America, ages must have passed before the red man had so far elevated himself to build extensive cities of hewn stone, profusely ornament his temples and palaces, invent pictorial, symbolic, and phonetic signs, hieroglyphs, and then that key-stone of intellectuality, an alphabet (the Maya alphabet) to record the history of his doings, as we see he did in Yucatan. In all probability alphabets of the Maya character were known throughout Central America.

With the conquest of the New World by the Spaniards, they divided it into despotic viceroyalties, which system lasted to within our own times, when the descendants of the Conquistadores and mixed breeds rebelled against their masters, driving them back to Europe; so, excepting the Portuguese empire of

Brazil, and the interior wildernesses, Spanish America became divided into a number of military republics, very difficult indeed to settle down. When the late civil war broke out in the United States Napoleon III considered it probable that the Southern States would have been able to hold their own, and with the wish of a party in Mexico, induced the Austrian prince Maximilian to become the emperor of that country. The Southern States failed, the republicans in Mexico took fresh courage, assailed the empire, which ended on the 19th of June, 1867, by the shooting of Maximilian. Yucatan and Chiapa are now frontier Mexican states; Guatemala, San Salvador, Honduras, Nicaragua, and Costa Rica have been turbulent republics; Belize, the settlement of the British log-wood cutters, is tranquil.

Before comparing the hieroglyphs of Central America by the Maya alphabet, hieroglyphs of months and symbols of days, I will give the result of my analysis of these arrangements.*

The alphabet is composed of twenty-seven characters, seven of which may be called simple forms; ten semi-compound and ten compound. The six additional characters are composed of *a* and *h*, the signs *ma* (no), and *ti* (of), and the "sign of aspiration," probably meant for a stop.

Doubtless the commencement of the Maya writing was purely figurative. For ideas came characters or symbols, some phonetic, out of which arose the alphabet. We see there were seven simple alphabetic characters; may we not suppose, if time had been given to the Mayas, they would have arrived at an alphabet entirely of simple forms, like unto other nations?

The conquest of the country by the Spaniards, and the almost annihilation of the natives, have thrown a dense veil over the peculiar advance from the savage life of Central America, as well as over that of other portions of America.

There are eighteen compound characters for the months, which have seemingly little or no connection with the alphabet; but they contain portions of the symbols of the days. The

* See vol. ii, *Memoirs of the Anthropological Society*, 1865-6, for plates of the alphabet, &c.

symbols of the twenty days of the month are each contained in a circle, and have but slight portions of the alphabet.

C. R. Lepsius, in his Standard Alphabet, divides all languages into literate and illiterate, the former commencing with the Sanscrit and ending with that of Madagascar. The illiterate, with no alphabets, beginning with the Australian ending with the American, in the last appears the Maya. *Now the Maya has its alphabet.* The Spaniards taught the Mayas the use of the Spanish letters, by which the former learnt the Indian language; vocabularies were produced, then a grammar, showing the Maya to be a gender and literate language; and Padre Beltran, in his grammar of 1742, says, the Maya is polite in its diction, elegant in its periods, and concise in style, capable ofttimes of expressing, in a few words and syllables, the meaning of many phrases.

It is generally stated that the Maya appears to be the mother of the greater portion of the Central American languages; but B. de Bourbourg asks, is the Maya the mother language of the Central American group, or is it only a sister to them?

As Humboldt found no alphabetic characters in Mexico, he was led to suppose that the progressive perfection of symbolic signs, and the facility with which objects are painted, had prevented the introduction of letters; so he concluded that there existed no certain proofs of a knowledge of an alphabet by the Americans.*

YUCATAN.

Traditions allude to a period when the plains of the interior were covered with water, and when isolated groups of families

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* In May, 1868, B. de Bourbourg published his *Quatre Lettres sur le Mexique*, &c. (Trübner), in which he, as a monogenist and from recent studies of Mexican and Central American MSS., has come to the startling conclusion, that man and his civilisation came from the *West*, rather than from the *East*. A great cataclysm of fire and water was the prime mover some six or seven thousand years since. After twenty-five years of research he was certainly rewarded by finding Landa's Maya alphabet, by which he examined Mexican and Central American hieroglyphs, and after six months' work he exclaimed, "Eureka." As a polygenist I fail to see the matters under consideration as he puts them.

lived on the more elevated portions;* that people came from the west under a mythic personage, Votan, and settled, where Palenqué was subsequently founded. A portion of Votan's people, under a great priest chief, Tzamná, Zamná, Kukulcan, or Kinch-ahau, king or magician, went by the coast of the Gulf of Mexico, and took possession of Yucatan, then called Maahya, land without water, by the original savage inhabitants, who supplied themselves with rain water from natural wells.

The first place supposed to have been built by Zamná was Mayapan, some accounts say as late as 200 A.D.; I, however, think if Zamná built Mayapan a very much earlier date must be assigned. The temples and dwellings of Zamná, and those of the priests were within a precinct; outside lived the chiefs, and, farther off, the people. Zamná became engaged in various and distant conquests; those of his race were called listeners or believers, and they governed the conquered countries. Zamná, having attained a great age, saw the progress of a civilisation he had founded in Yucatan, including the invention of a calendar and figures and characters which served for letters; he went to Itzmal, when he died. According to Lizana, altars were erected to the oracle Zamná after his death, and roads of stone made to Tobasco, Chiapa, and Guatemala, for the pilgrims who flocked to his shrines.

After the death of Zamná, the chiefs chose their rulers from the family of Cocomes, and the reigning king was called the Cocom. The post of high priest was hereditary in a certain family. The priests instructed the people, particularly in reading and writing; their books, or analtés, written in human and other figures and characters, on a strip of material made of the bark of trees, the pages doubled backwards and forwards, and enclosed in ornamental covers.

The kingdom of Mayapan, after years of prosperity, appears to have been invaded by Toltec hordes, which may have left

* Yucatan, according to B. de Bourbourg, seems to be a vast calcareous formation, composed of fossil shells, and in the appearance of the immense plains, so singularly undulating, thinks he sees the result of volcanic power, which has lifted the surface up, when in a boiling state, giving it the appearance of sea waves.

Tula in Mexico about 150 A.D., led by a chief or chiefs called Tutul-Xuis, who settled after a time, some say about 400 A.D., not far from the city of Mayapan, and were friendly with the Mayas.

The Cocomes tyrannised over their people and called upon the Aztecs of Mexico for assistance. The majority of Maya chiefs rose against the Cocom of the day, who was killed with all his race, except one Achel who was absent, and Mayapan was ruined about 1446 A.D. Achel who had married a daughter of one of the priests of Mayapan, established himself at Tekax, and with him originated the great family of the Cheles (holy), who soon governed a large tract of country, even to Itzmal.

When the Spaniards discovered the land, there were three reigning families, the Cocomes, the Xius or Strangers, and the Cheles, the latter now a sacerdotal class; but in consequence of rivalries between them, their conquest by the Spaniards was easily accomplished.

Ti-hoo, the principal city of the Cocomes, became the Spanish capital of Yucatan under the name of Merida. Chichen-Itza was only conquered by the Spaniards in 1697. Those natives who submitted to the Spanish yoke were denominated *Indios hidalgos*; those who would not submit, *Indios bravos*; and many have so continued to the present time.*

Cogolludo observes as to the belief of the Mayas, that it was one sole Deity, *formless*,† and incapable of being represented, it bore the name of Hunab-Ku, from whom proceeded all things, and not being corporate, was adored in no imaged shape. Xibalba was the devil, who suddenly appears and vanishes. Their sacrifices were men, women, and animals.

In-acal-Voh, a powerful goddess, was the mother of Zamná. The goddess Yxchebelyax invented painting. Xocbitum the

* A curious resumé of Yucatan history, collected by Pio Perez from a Maya MS. written in Spanish letters, will be found in vol. ii, Stephens' *Incidents of Travel in Yucatan*, in Spanish and English; also in B. de Bourbourg's *Landa's Cosas de Yucatan* in Maya and French.

† This same *formless* character of the Deity is noticed among the Quichés of Guatemala; and in a drawing preserved in a Quichua MS. of Peru, the same *formless* character was given to the Deity in the Temple of the Sun at Cuzco.

god of poetry. Ah-Kin-Xooc the god of music; of war Ku Kulcan. Bacab were the Atlantean gods and prototypes of Eolus and his fellows. Chac, a giant, was the inventor of agriculture and the ruler of lightning and thunder. The idol Kinich Kakno was fashioned like a sun with the beak of a bird, and descended to burn the offered sacrifice at mid-day. At Campechy was a god of cruelty Kinchahan-haban; at Tihoo his name was Achun Cam. The list closes with the deification of those women who had remained virgins, and were called Zunhy Kak, or virgin fire.*

I now proceed to make the necessary extracts and compare† the hieroglyphs of Yucatan with the Maya alphabet, commencing with what is found in vol. ii, Stephens' *Central America, Chiapas and Yucatan* (I also occasionally follow Landa, and B. de Bourbourg). *Uxmal*, page 413. The elaborate ornaments of Yucatan bear no resemblance to those of Palenqué or Copan. Page 432. There are no idols with hieroglyphs as at Copan, no stuccoed figures or carved tablets as at Palenqué; but Stephens saw a beam of wood ten feet long, on the face was a line of characters carved or stamped with hieroglyphs almost obliterated. He had to leave Uxmal in haste on account of illness, and deplores he did not obtain this sculptured beam. He observes by what feeble light are the pages of American history written. Except this beam of hieroglyphs, though searching earnestly he did not discover any points of resemblance, and the wanton machete (chopper-knife) of the Indian may destroy the only link that can connect Yucatan, Copan, and Palenqué together.

Page 434. On one side of the house of the Governor, is a large greque, maybe part of the symbol *uo*, "frog." The faces

* Waldeck, *Antiq. Yucatan et Palenqué*, contains an interesting Maya poem, translated into Spanish, then into French. The love of the Vestal Pixan (soul or spirit), for the hunter Concoh (the Puma), and the enmity of the High Priest Patzin-Can.

† For these comparisons I have had recourse to the Maya alphabet according to Landa in his *Relacion de las Cosas de Yucatan*, in which is grammar and dictionary in Maya and French by B. de Bourbourg, Padre Beltran's Maya and Spanish grammar and dictionary, 1742. Maya and English vocabulary in Norman's *Rambles in Yucatan*, 1833.

with figures more naturally drawn than in the profiles in the Dresden, Troano, and Paris codices.

Page 442. There is no resemblance in these remains, including those of Copan and Palenqué, to those of Egypt; they stand alone. Stephens says: "I cannot help believing that the tablets with hieroglyphs will yet be read. . . I feel persuaded that a key surer than that of the Rosetta stone will be discovered." The Maya alphabet preserved by Landa and recently found by B. de Bourbourg in Madrid looks very much like a key.

MAYAPAN. I now follow Bishop Landa. In the principal square were seven or eight stones, eight feet in length with inscriptions, but so injured by rains that they could not be made out. It was thought that on these stones had been written an account of the foundation of this capital. It was the custom to erect a stone at the end of an epoch of twenty years, which accords with the computation of the cycles. According to Cogolludo, these four periods of five years, making twenty, having arrived, they called it Katun-Kat, "to ask;" Tun, "stone;" or the stone that was to be interrogated, and placed one graved stone upon another, set in with mortar in a wall in the temples and dwellings of the priests, as we see them at this day. . . When Mayapan was abandoned by its lords (1446), retiring to their domains, the priests in particular took the books of their sciences.*

* After this paper was written, the *Archives de la Commission Scientifique du Mexique* was issued, from tom. ii, livraison iii, p. 234. I translate the following by B. de Bourbourg:—Whilst the Indians were clearing away plants and trees of the locality designated by Landa, a flat stone, rounded at one end and broken at the other, was found on the ground. The characters of the inscription were effaced, excepting one, which I identified by the Maya alphabet. The form of each small square was similar to the cartouches of Palenqué. At ten paces another stone and in better preservation was found, but the inscription was obliterated by time and the action of water (a drawing is given in the work). It is a true *stèle*. The lower portion broken off, but in its present condition 1 mètre 75; width 0 mètre 50; and mean thickness of 0 mètre 20. The profiles are similar to those in the *Codex Mexicanus* No. 2 in the Bib. Imp., Paris, and that of Dresden in the Kingsborough collection. I am persuaded, had I been allowed by Senor Salazar to make the necessary researches in the vicinity of the pyramid of Mayapan,

I now refer to Stephens's *Incidents of Travel in Yucatan*, vol. i, p. 78. *Tihoo* became the Spanish city of Merida, 6th January, 1542. On a pyramid was the Yahau-Kuna, or principal temple; here the Spaniards built a convent, also another on the pyramid of Ahchun-Caan. (Norman, in his *Rambles in Yucatan*, mentions, that the front of Dr. Simon Peon's house is ornamented with a relic, a huge doorway, elaborately carved with figures and lines.)

Mayapan. These ruins are like those of Uxmal. There are besides representations of human figures, animals, and other objects. A male figure with a shield, on which seems to be the symbol *muluc*, "to unite"; and on the head another symbol, probably the name of the individual. There are also markings indicating, probably, *uo*, "frog"; and the word *muan*, "strength".

Uxmal. The names given to the various ruins afford some idea of their character; they are the houses of the vestals, dwarf, magician, doves, turtles, and of the old woman.

Page 168. There is a well-defined symbol with dots, which I call the curved symbol, and may mean "moon" or "month".

Page 171. On the ornament of the house of the governor are two symbols, partaking of the word *lamat*, "governor or heritage."

Page 175. The character of the faces on the Ticul vase, are something like those in the Dresden Codex.

Page 302. On a portion of the western building of the vestals are two large greques, which may be connected with the words *uo*, "frog", and *muluc*, "to unite."

Page 307. On the south-east angle of the house of the vestals, I trace *muluc*, "to unite; *lamat*, "governor"; which last symbol is often seen in the Dresden Codex; and *eznab*,

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I should have come upon entire *stèles*, bearing inscriptions I could have read. Description of the *stèle* by W. B. In the upper portion are the places of six lines of six cartouches=36. No hieroglyphs can be traced, where once was written the doings of these figures underneath. Then follow four lines of ornamentation of angular, circular, and castellated forms which may have a meaning. Then follow the profiles of two human figures, the larger may be that of a king.

"magician or prophet". Norman, p. 162, gives two objects; one a well-defined symbol, containing a double triangle; also, a stone eight inches by six, with numerative characters.*

Kabah, p. 388. Here is a large stone, with a continuous line of hieroglyphs; also, traces of the curved symbol, and repetitions of something like *eznab*, "magician".

Page 405. Carved beam of sapote wood, apparently representing a female figure. The only indications I make out are repetitions of *chiccan*, "little maize". Can this be the goddess of maize? The elaborate carving here seems to have been done by copper, bronze, obsidian, or flint tools. Norman says the rock of Uxmal is calcareous with flint.

Page 412. Two sculptured human figures on jamb of doorway, I think I can make out *muluc*, "to unite;" and *lamat*, "governor."

From ii vol. Stephens *Travels in Yucutan*:—

Zayi, page 21. A bold figure of a water animal or serpent; its symbol or name has a portion of *muluc*, "to unite."

Labna, page 56. Here are indications of *uo*, "frog;" *muluc*, "to unite;" also, a large symbol of double greques and lines.

Kewick, page 73. Bright red and green predominate in the paintings. A human figure surrounded by hieroglyphs, which doubtless contain its history. I make out *cimi*, "to die;" *na*, "house or mother;" *oc*, "handful."

Sacbey, page 122. Symbols very indistinct. Here is a roadway of stone eight feet wide and eight to ten inches high and covered with a cement. It is called *Zac-be-zac*, "white;" *be*, "road."

Labphak "means ruins or old walls." Page 164. Here are carved tablets set in walls as at Palenqué, and according to Stephens have something of the character of the figures there.

Mani, page 257. Piles of Indian books were burnt here by the Spaniards as well as paintings! In the library of the Casa Real there is a MS. of 157 pages written in the Maya language,

* B. de Bourbourg thinks he can discover representations of the Phallus here.

records of events after the arrival of the Spaniards. The Tutul-Xuis sojourned here for a time.

Chichen-Itza, page 285; *chi*, "mouth;" *chen*, "well." Here are extensive ruins, including one, the Akatzeeb, or the building with the writing in the dark.

Page 292. Sculptured figure with hieroglyphs on the upper part of the door called Akatzeeb. It was here Stephens first found hieroglyphs sculptured on stone. The sitting figure seems to be performing an act of incantation, or religious rite, which the writing in the dark may explain. Stephens observes:—"Physical force may raze these buildings, and lay bare all the secrets they contain, but physical force can never unravel the mystery that involves this sculptured tablet." The figure (male) is nude; the cap is like those on the figures at Kabah and has an ornament round the neck; the large crucible-form before him contains fire, in which some small animal is being burnt or sacrificed. Comparing the hieroglyphs on either side of the figure with the Maya key, I get the following words—*Ahau*, "king;" *oc*, "leg;" *muluc*, "to unite;" *ik*, "courage;" *cib*, copal; *eznab*, "magician;" *uo*, "frog;" which may mean that the magician has in the crucible a frog to be sacrificed, in which copal as incense is used. The two lines of hieroglyphs give something like the following:—Kings must die—they have courage, and after death are united to those who went before them. The king is with his fathers, the chief and his family, burn copal and mourn for his death.

Page 293. On the beautiful ornamented house of the vestals, there are among other symbols those of king and chief.

Page 294. On same building a ⊤ figure is seen. This form is also found at Palenqué. In the Maya symbol *manik*, "feast," there is a ⊥ reversed.

Page 296. An apartment once ornamented with paintings in colours. There are portions of human figures very well drawn, the heads adorned with feathers, and in the hands shields and spears.

Page 300. The Chichanchob or Red house. Along the top of the back wall is a stone tablet, with a row of hieroglyphs.

I get out as follows—king, to die, to unite, T, water, staff of office, steps, courage, to talk, breast, feast? little or little maize.

Page 308. In the lower part of the building of the Pumas, one of the walls of a chamber is covered with elaborately sculptured male figures in bas-relief dancing. This chamber is called stohl, and this word means an ancient dance. The outlines are well drawn. Each has a symbol or name before him.

Page 310. In the upper building, Stephens says, is presented a casket, the greatest gem of aboriginal art. The sculptural figures have rich headdresses. . . The walls and ceilings are covered with designs in painting, representing, in vivid colours, human figures, battles, houses, trees, and scenes of domestic life; conspicuous is a large canoe. They exhibit a freedom of touch which could only be the result of discipline and training under masters. The author of this paper considers the profiles in the Dresden Codex good in design, but these are superior in every way.

Page 341. Large carved and highly ornamented figure in sapote wood, the face may have been a portrait. *Tuloom* on the east coast and near the island of Cozumel (Ahcuzamel, or that of the swallows, or that a deity was worshipped here having feet like the swallow). Here is a symbol repeated, like one at Palenqué, but only of four castellated niches.

Itzmal, page 434. There was an idol here erected to Zamná, who when asked about himself, replied, "I am the dew of the morning, or the substance of the clouds," or that he was of supernatural origin.

The conclusion I have come to after comparing the Yucatan hieroglyphs with the Maya alphabet, seeing that I am able to read so few, is, that they may be of older date than the alphabet. but that the symbols of the days of the month are nearer the date of the hieroglyphs. The painted profiles at Chichen are more artistic than the profiles in the Dresden, Paris, or Madrid Codices.

The occasional appearance of the T figure at Chichen, but in greater number at Palenqué, would tend to show, that there had been connection between the two places.

Palenqué.

Tradition leads to the idea that, between Yucatan and the coast of the Pacific, existed the very ancient empire of Xibalba, also known as Ah-tza, or Itza, and it may be that Palenqué was the capital. Del Rio and Dupaix christened the spot with the name of Ototíum. Stephens calls the river near the ruins Otulo. Tulum, in Maya, means "a fortification", or "stone edifice." Aguilar calls the place Palemqué, probably a Tzendal word. In a Tzendal MS. Palenqué is called Ghochan. Brasseur de Bourbourg thinks that Palenqué may be identified with the Colhuacan, or Colhua, of Xibalba, the capital of the Colhuas, or Chanes, an ancient Mexican nation. Ordoñez says, Chan, or serpent, was another name for Colhua, ; and that the capital (Palenqué) of Xibalba is identified with Na-chan, the city of serpents. Galindo observes that the place was abandoned, and the memory of its existence lost, long before the coming of the Spaniards.

The wonderful ruins of Palenqué are in about 17° N. and 94° W. They were accidentally discovered by the Cura of Tumbala, Solis, in 1746. In 1773, the place was visited by Spaniards named Torres, Ordonez, and others. In 1784, Lieut. Calderon went officially and reported on the ruins; he called it a great city, and gave a list of fifty-six separate ruins; and it appeared to him to have been abandoned some three to four hundred years. In 1785, Bernasconi, an Italian architect, examined and made plans of the ruins, which Dupaix and others most probably had means of referring to. In 1787, Del Rio was sent there officially. His report and drawings remained shut up in the archives of Guatemala, but copies were made of them; however, the original MS. came into the hands of an English gentleman, who gave publicity to them in London in 1822.

Whilst the report and drawings of Del Rio slept in the archives of Guatemala, Dupaix, an Austrian officer, accompanied by a Spaniard, Castañeda, were sent, by Charles IV of Spain, to that country, where they remained from 1805 to about 1808. The Dupaix MSS. were forwarded to Madrid, then occupied by the French. In 1828 they were brought to light. In 1834, Lord Kingsborough published, in his large work on *Mexican*

Antiquities, Dupaix's drawings and researches. In 1831, the *Literary Gazette* announced Palenqué as a new discovery by Colonel Galindo, who sent his observations to the Geographical Society of Paris. Waldeck passed some years at Palenqué, and made elaborate drawings, which were published by the French government in 1865-6, with letter-press by the Abbé B. de Bourbourg. After Waldeck, an Austrian officer, Fredricksthal, explored the ruins.

I now allude to the masterly investigations of Stephens in 1839, and the accurate drawings by his companion Catherwood. I compare the hieroglyphs of Palenqué in vol. ii of Stephens's *Central America, Chiapas, and Yucatan*, by the Maya alphabet.

Page 315. On one of the figures I trace something like the Maya month *Pop*, "mat of reeds". Page 316. On a bas-relief is the symbol of *ahau*, "king", reversed, or, probably, that the king is dead. We find the ⊤ figure like that described at Chichen, in Yucatan; also, an approach to *zeb*, "rapid" or "prompt". Page 342. Outside corridor, No. 1 casa. The right hand tablet has twelve lines of twenty-four cartouches in each line. In the first column, I make out part of *zip*, "tree". Fourth column, *ahau*, "king", and a form of *lamat*, "chief". Page 344. Tablet of the Cross. In one of the squares I trace *eznab*, "magician"; a hand, or *dz*, is seen; also, the Maya "aspiration sound" ∪; a part of *zip*, "tree". The principal figures here are a male and female; the former presenting a child to the sacred bird. Amongst the hieroglyphs I only trace *ahau*, "king", a form of *zip*, "tree", *akbal*, "a plant", *pax*, "a musical instrument". Surely these Palenqué people must have had some form of alphabet to have composed such records.

The frontispiece to vol. ii has a perfect tablet at the back of Casa No. 3. The male and female figures presenting young children to the emblem of the sun. In the smaller tablet, *ahau's*, or kings, are traced, and perhaps *cib*, "copal". In the tablet on the left, I find parts of *manik*, "feast", *zip*, "tree", and *lamat*, "chief" or "governor". Page 349. Only one statue has been found at Palenqué; it has all the severity of the Egyptian style, and nothing like the bas-reliefs. It holds in

its right hand, which is on the breast, a castellated symbol (like that described at Tuloom, in Yucatan); from the left hand is suspended an elaborate symbol, telling, doubtless, of his office. The cartouche at the extremity seems to represent a tortoise, and numerical dots are seen.

Page 352. Bas-relief, on side door of altar, is a male figure; and on what may be called the front and back tail are forms like capital C's, with dots and lines. The figure is blowing fire out of his mouth through a tube; he is probably a magician. The figure has cartouches in front and above, in which I trace kings and trees. All I can make out is, that the relationship of the hieroglyphs between Palenqué and Yucatan is trifling. The existence of the few T figures at Chichen, in Yucatan, compared with the larger number at Palenqué, may, however, show connexion at one time or other.

Guatemala.

I have already alluded to the empire of Xibalba, and amongst other states to that of Quiché in this region. It would appear that hordes of Nahuas, or Toltecs, came from Mexico, and got footing in the country, expanding themselves into Yucatan, Nicaragua, and perhaps further south. For recent researches into the history of this portion of America, I refer to B. de Bourbourg's interesting work, portions of which I have brought before the Royal Society of Literature, in papers entitled *Popul Vuh: or, the Ancient History of Guatemala*, vol. vii, part ii; and the *Rabinal Achi*, a drama, read March, 1862.

If, as it is sometimes asserted, that the *Popul Vuh* of the Quichés was the foundation of the *Teo-Amoxtli*, or sacred books of the Toltecs, surely there must have been very early writings in Guatemala. Las Casas frequently alludes to the sculptured stones and writings of the Quichés; and he is accused of burning all the MSS. he could lay hands on in this country, as Landa did in Yucatan and Zumarraga, in Mexico, "because they were the works of the devil!" I know not of one example of an ancient MS. from Guatemala. The Codex Mexicanus, No. 2, in the Imperial Library at Paris, is sometimes called the "Guatémalien." I have examined and compared it with the Dresden Codex and the Maya alphabet, and find both

Codices identical; the Paris one looks of older date. It is probable there are Quiché MSS. in some of the convents of the country, in Spain, and Rome. Santa Lucia Cozumaluapan, in Guatemala, is remarkable for fine sculptured monoliths, twenty feet in height, which have not been drawn or described. The whole country is strewed with ruins of pyramids, tumuli, temples, statues, etc.

Copán.

The ruins known as those of Copan, in Honduras, are in about 14° 15′ N. and 89° W., in the old district of Chiquimula. In 1530, the natives revolted, and attempted, but without success, to throw off the Spanish yoke, the then chief of the country being Copán-Calel. Chiquimula has been called the Kingdom of Payaqui, meaning, between the Toltecs and Nahuas, and that the capital was Copán. It has been a question whether the locality of the ruins was the place defended by Copan-Calel against the Spaniards. We may now, I think, decide in the negative, since Mr. Squier has published Palacio's letter to the King of Spain, dated 1576, which contains the earliest account of the ruins by Palacio, who visited them within forty years after the conquest, and found them nearly in their present condition. He says, speaking of this district, "they have no books now relating to their antiquities; nor do I believe there is more than one book, which I possess." We have no account of where this one book may be.

Fuentes wrote about Copan in 1689, and from his MS. Juarros mentioned the place in 1809. In 1835, Colonel Galindo sent a description to the American Society of Antiquaries, and Geographical Society of Paris. Stephens explored here in 1841. Photographs were taken by Mr. Salvin in 1862, and by Dr. Ellery in 1865, who informs me that the rock of the country is porphyry. Stephens says that the quarries of Copan are of soft grit; that the sculpture was performed by tools made of the Chaya stone. Stephens held out hopes of a clue to the deciphering of the hieroglyphs being obtained from the independent Indians, living *somewhere* on the banks of the river Usamacinta, deriving that hope from an account given him by

a priest at Quiché, of an Aztec (?) city, he said he had seen from the top of a mountain, near to the village of Chajul.*

Examination of the *Copan hieroglyphs* in Stephens's *Central America, Chiapos, and Yucatan,* vol. i; also, Salvin's photographs.†

Page 136,—Stephens. A column, or idol, which give the peculiar character to the monuments at Copán, is H. 14 of Salvin. H. 15 is a portion of the carving of this idol of two parrots' heads, having dots in the eyes and on the head, which, with the horizontal bars, may have to do with numeration.

Page 140 is J. 18. A female figure. In the lower portion I find what may be the Maya *lamat,* "governor". Page 141. The top of an altar. Of this Dr. Ellery has given me the photograph. It is six feet square and four feet in height; the top divided into thirty-six tablets of hieroglyphs; it may be a ritual. In second line, second figure, are some modern marks. Second figure, in third line, may be *ahau,* "king". Third figure like *yaxkin,* "beginning of summer". Fifth line, fifth figure, may be *chiccan,* "little maize seeds". Sixth line, third, fifth, and sixth figures seem to have been placed by a modern hand. Page 142 and R. 23. On one side of the altar, *ahau,* "king", appears. On another side there is an approach to *Ik,* "courage".

Page 151 and C. 16, the back C. 15. There is a group of hieroglyphs. Stephens says, "We considered that in its me-

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* See "Notice of Aztec Race" (?) by Mr. Cull and Professor Owen, in *Journal of the Ethnol. Soc.,* 1856. The two children were then in the possession of Mr. Morris. I saw them exhibited, by the same person, in 1864, as Aztecs. They had grown considerably; and the boy appeared to be more idiotic than the girl. In *Dic. Univ.,* Paris, 1857, vol. ii, art. "Aztéques," M. Boursier, late French Consul in Quito, communicated a letter from General Various, formerly Governor of S. Miguel, in the Republic of San Salvador, in which it is stated that the children were taken away from Jacotal to New York for exhibition, by a Yankee; that they are *brother and sister;* that the mother and father are Mulattos; and that they were known in the country as the *monitos,* "little monkeys". In the *Daily Telegraph* of January 8, 1867, is an account of the *marriage!* of the said-to-be-Aztecs, Maximo Valdez Nuñes and Bartola Velasquez (see No. xwii, *Anthropological Review,* April, 1867, for details.)

† Published by Smith, Beck, and Beck, Cornhill, 48 photographic views.

dallion tablets, the people who reared it had published a record of themselves, through which we might one day hold conference with a perished race, and unveil the mystery that hung over the city."

Page 153 and F 12. Third figure from the top is a bird's beak in the mouth of an *ahau*, or king. A drawing similar to this is in the Dresden Codex; there is also a portion of a *cauac*, or cavac, staff of office.

Page 156 and D 8. One of the two principal cartouches, is an approach to *be-en*, to expend with economy; there is also a part of *E*, them; a part of *ahau*, king, or *ahaue*, queen.

Page 158 and A 2. Some *ahaus*, kings.

Stephens observes: "Copan may have been a holy city, the Mecca or Jerusalem of an unknown people; I believe that its history is engraven on its monuments;" and he infers that the Mexicans had the same written language with the people of Copan and Palenqué. I do not coincide with this view, but rather that the people of Copan and Palenqué had each their own graphic arrangement. In regard to the people of Yucatan we have had lately brought to light their Maya alphabet. As yet no alphabetic arrangement has been discovered in Mexico.

Having examined the hieroglyphs of Yucatan and compared them with the alphabet, they seem to me to be more ancient than the alphabet. In regard to the hieroglyphs of Palenqué, I am led to believe that there is more similarity between them and those of Yucatan than with those of Copan. As to the hieroglyphs of Copan, they stand rather alone, but if any thing, approach slightly to those of Palenqué; as Copan and Palenqué have more of the figurative character.

British Honduras.

For years past indications of ancient ruins have been met with of Yucatan character. At present there is an expedition exploring the river Mopan, or Belize, under Dr. Berendt, who has the intention of going as far as Lake Peten. Seven fine palaces are said to have been fallen in with already, larger than the monuments of Palenqué, among the ruins of a vast city.*

* June 16, 1868, Mr. ——— presented stone head of idol, from this district, to the Anthropological Society; looks like a volcanic stone; also, some crania.

Dresden Codex.

With B. de Bourbourg's intimation that the Dresden Codex, and the Codex Mexicanus, No. 2, were in identical characters, I proceeded to examine the facsimile of the Dresden in the Kingsborough collection, and compared page 23 with a photograph from the original, kindly sent to me by Dr. Förstermann, the royal librarian at Dresden. In this communication I can only give a few results, reserving for another opportunity the readings I may obtain from the three Maya codices.

According to Humboldt, the Dresden Codex was purchased in Vienna, in 1739. It is of a material made of the agave, and in form like those of Mexico, that is, a *tabella plicatiles*, nearly twenty feet in length, containing forty leaves, covered with paintings. Each page is seven inches and three lines in length, and three inches two lines wide. The form, analogous to the ancient diptychs, distinguishes the MS. at Dresden from those at Vienna and the Vatican; but what renders it remarkable is the disposition of the simple hieroglyphs, many of which are arranged in lines as a real symbolic writing. He also calls this a *calculiforme* system of writing, which term, I suppose, indicates the recurrence of the red and black dots and the red and black lines, of which I am not as yet able to offer decided explanation, but they may indicate numerical value, particularly in connection with periods of time. The Mayas counted as follows: four 5=20, five 20=100, four 100=400, twenty 400=8000, twenty 8000=160,000, and even further.

The Dresden Codex contains records of the mythic, historic, and ritualistic character; and, like the other two, made up of profiles and writings, or that by the side of the profiles, which express symbolically the facts, are found the explanation in phonetic characters.

The photograph of page 23. I have read from the bottom upwards, and from right to left.* The first group is apparently a mother holding a young girl before her, and a younger one is carried at her back. The mother's name or rank is designated

* In B. de Bourbourg's "Quatre Lettres," etc., he says the MSS. are to be read from right to left; then one side, and then the other of the page.

by a symbol on the head. The reading of the hieroglyphs about the group seems to be as follows: *We come to thy presence to implore.* The second group,—a female with a deity or magician: *The young female implores before the Deity, she weeps but has courage.* The third group probably represents a king and a young female: *She has made a vow about the king to the magician . . . the king is happy . . .*

The second compartment contains a sitting female figure, who makes offering of a tortoise. Here are symbols of chief, magician, queen, to unite; may mean—*that after her marriage to the king she presents an offering of a tortoise.*

There are now four lines of hieroglyphs, of which the following may be the meaning: *The sacred bird chel is sacrificed, there is weeping; the bride weeps for the bird, she makes a vow or prays for the king, she offers a tortoise, a great feast is given.*

The third compartment. Here is portion of a female figure, holding a symbol like part of *ik*, courage; and, *Thou, O king, hast given us the fish feast; we have cried for joy.*

I can only here offer a very brief summary of the principal subjects contained in the Dresden Codex.

1st section, pages 74 to 70. Mythic personages, man and woman, who have come to Yucatan; they have procured water for the aborigines. The symbols generally seem to have reference to periods of time; the hieroglyphs to the historical portions.

2nd section, pages 69 to 60. The mythic personages are deified; something like union of the sexes; warriors appear; canoes seen; fishing; priests; diviners, or magicians; sacrifices; a chief taken prisoner and brought before a king.

3rd section, pages 59 to 51. Symbols and hieroglyphs, probably detailing the circumstances of section 2. At page 53, a woman is seen hanging, and as if dead.

4th section, pages 50 to 46. Well drawn and finely coloured. 50 is a man with a book trembling before a priest, or king; representation of combats, in which warriors, priests, magicians, deities, and animals are depicted.

5th section, pages 45 to 29. Domestic scenes, people weeping; the sun; warriors with tomahawks; men in canoes; warriors killing a chief or king; animal with lighted torch; *un*

rapto. Drunken man on the head of tapir; woman with water; young woman in canoe with an old man; an apartment, with emblems before a king; another apartment, man playing a pipe, another beating a drum; a ladder; man with tomahawks; men in canoes; authority, with staff of office; magician, holding an animal by the tail which is vomiting water; man paddling canoe.

6th section, pages 28 to 25. Figures well drawn and coloured, bold and expressive; deities, with heads of animals; authorities, with staff of office; kings, magicians, priests or sacrificers. This section comprises religious doings.

7th section, pages 23 to 16. Page 23 already alluded to. Priests, women, and children; women and children imploring deities; women weeping, and apparently dead children; old man weeping; many women.

8th section, pages 15 to 1. Deities, men and women; men and women making offerings of fruit and flowers to deities connected with the dead; old and young men, some weeping; men in the act of carving symbols on stones, and by twirling an instrument in the hands. 3. This is a curious compartment. The principal figure is a nude dead man, and the symbol of *ahau*, or king, is observed. From the centre of the body rises a figure, with a hawk's head and has four wings, having in its beak what may be meant for one end of the entrails. Four groups of figures surround the corpse. This may be emblematical of the soul or life going to another world. 2. Magician and another person performing an incantation over fire; male figures; a man with another on his back.

The pages are mostly in three horizontal compartments, and these divided into three perpendicular ones. All the pages have symbols and hieroglyphs, the reading of which is now occupying my attention. This Codex may have come from Mayapan.

Codex Mexicanus, No. 2 of Paris.

I examined this Codex in Paris, of which there is no account of how obtained. It is not in a good state of preservation. It is composed of twenty-two pages, bent backwards and forwards, rather larger than in the Dresden, being about nine and a half

inches in length by five wide; the page generally divided into three compartments. The colouring is much less varied than in the Dresden, only green with brown outline on a white ground. My brief examination is from the photographs.*

No. 1, *recto*, first or front page.—Illegible. No. 2, *verso*, or back of first page, I find—part of well or water; wind; king (reversed); part of staff of office; chief; to talk; dots and lines in all the pages, as seen in the Dresden. No. 3, *recto*.—Parts of well or water; moon or month; part of summer; profiles less artistic than in the Dresden. No. 4, *verso*.—Kings; to die; tell; him; no; male figure with hawk's head, apparently before a deity. No. 5, *recto*.—May be two kings; male figure and bird; wind; of him; to die; them; to go. No. 6, *verso*.—Human figure with head of animal, under a canopy; them; to go; wind; part of summer; another seated figure; water; courage; two indistinct figures; king (reversed). No. 7, *recto*.—Male figure; to talk; foot; male figure on a fish; offerings of heads of fish; kings; figure under canopy. No. 8, *verso*.—two figures seated on hieroglyph form of the word king; king; male figure making offering to a king; to die; water. No. 9, *recto*.—Two figures seated on symbol of kings, one has part of to die as an eye; two kings; water; to talk; staff of office; courage; human figure with hawk's head. No. 10, *verso*.—Down the centre nine well marked symbols of *Be-en*, probably to expend with economy; nude figure as if in water. No. 11, *recto*.—Ten large symbols like *Zec*, to talk, on right male figure; left male figure under a canopy, on symbol of kings; a figure painted black (a priest) with staff. No. 12, *verso*.—Two male figures seated on symbols of kings; two kings; symbol of summer; to die; staff of office; figure painted black with staff. No. 13, *recto*.—Two male figures seated on symbols of kings; centre, an old man; unknown symbols; king; old man before a king or deity; to die. No. 14, *verso*.—Several indistinct figures; water; summer; symbols like those at page 74 of Dresden Codex; six series of symbols, among which I trace, breast, water, to unite, staff of office, wind, magician, kings

* A set is, I believe, now in the British Museum, presented by the French Government.

(reversed), and steps. No. 15, *recto*, about the best preserved page.—There are two horizontal lines of hieroglyphs; then a square of twisted rope, inside of which are two nude figures. On the left is an old man, on the right a young one; below, the body of a serpent covered with hieroglyphs, on the head of which are symbols of water, summer, trees. Underneath, figures of a young man and young woman each sitting on the tail of a serpent; this may be the son of a king about to be married. No. 16, *verso*.—Female seated on symbol of kings; two kings; a rabbit on symbol of kings; male figure offering to a deity; staff of office; bird sacrificed; king (reversed). No. 17, *recto*.—Figure on symbol of kings; figure on a skull; two kings; large central figure and animal with bird's head; king or deity; kings; to die; wind; summer. No. 18, *verso*.—To die; king (reversed); staff of office; summer; grotesque animals; four columns of symbols, apparently meaning moons or months; king; steps; may be the sign 4 *can* in the *ahau katun*, or century of the Mayas. No. 19, *recto*.—Wind; breast; summer; steps; king; copal. No. 20, *verso*.—Three figures seated on symbols of kings; two kings; to die; wind; kings; water or wells; kings (reversed). No. 21, *recto*.—Two figures seated on symbols of kings; two kings; to die; figure in centre. No. 22, *verso*.—Apparently plain.

This appears to be of the ritual, historical, and domestic character, and may have had its origin about Kabah.

Codex Troano or Madrid.

When in Paris, in October 1866, the Abbé B. de Bourbourg informed me that in the February preceding, being in Madrid, he met with this the third known Yucatan Codex in the hands of Don Juan de Tro y Ortolano,* a descendant of Cortez, who allowed the Abbé to bring it to Paris, when the government ordered it to be chromo-lithographed, under his and M. Léonce Angrand's superintendence. On examination, I found this codex, like the other two, composed of similar material, a paper of the agave and white coating, and painted on both sides. It is pretty perfect, has thirty-five leaves, or seventy pages.

* Professor at the School of Charts, Madrid.

Length of page nine inches and an eighth by nearly three inches. Like the other two, the pages are divided generally into three equal parts, horizontally. The style of drawing and finish is like that in the *Bib. Imp.*, but better coloured. The pages are made up of profiles, symbols, hieroglyphs, and red and black dots and lines.

The Abbé gives me the following:—"I cannot as yet tell you exactly what kind of document it is; but I suspect it is written in one of the Maya-Quiché dialects, and incline to think it may be a calendar used by the priests and land-holders. You have seen that it treats much of beehives. The scenes for making wooden idols are observed in this MS. The opossum is often represented. We know by the *Popul Vuh*, or sacred books of the Quichés, that the opossum opening his legs alludes to earthquakes; and in the Quiché language at Rabinal, there is a proverb in which the opossum has to do with the rising sun after an earthquake. In the Codex Troano, we often see the opossum chained and surrounded by water, excepting on one side.*

Resumé.—In my communications, particularly to the Anthropological Society, regarding the Red man of the New World, and his doings, I have considered him to be a distinct species, when even briefly examined by brain, crania, skeleton, physiology, etc.; if, then, he be distinct in physical points, is it to be wondered that what has emanated from him is peculiar to himself, and which, to my mind, has no connexion with the doings of other species of mankind. The last proof we have for this view of the subject is the recently discovered peculiar Maya alphabet of Yucatan, by which the Mayas have written their ancient history, its rituals, calendars, and other matters. By this alphabet I have been enabled to read portions of sculptured hieroglyphs and codices of Yucatan, and a few of the hieroglyphs of Palenqué and Copan.

That patriarch of travellers, F. de Waldeck, said to be over

* In B. de Bourbourg's "Quatre Lettres," etc., he offers for the age of this MS. one thousand years before our era; and that the Mayas preserved their books by washing them with an acetate of copper.

one hundred years of age, has issued a prospectus of his *Archæological Encyclopædia*, to contain more than two thousand subjects of antiquities from Mexico, Central America, and Peru. He alludes to the probable origin of the Red man and his works, being "either due to the Old World, or the Hindoo continent." With the monogenists he will be the last favourite; but with those of the polygenistic school I have embraced, we are at least thankful to him for his elaborate drawings; as we are to Lord Kingsborough for those in his work on the *Antiquities of Mexico*, by which he sought to prove the Jewish origin of the Red man! *Fictitious writings*. Waldeck, in his *Voy. Pitt. to Yucatan*, p. 47, gives drawings of twenty-eight alphabetic characters, engraved on a silver collar, reported to have been found at Chichen, in 1778, round the neck of an ancient skeleton! The letters are of Greek, Hebrew, Phœnician, etc., probably the joke of some lively young monk. At p. 64, Waldeck gives a drawing of what he calls an aboriginal saw,—the rostrum of the sawfish, used as a weapon of war, said to have been brought by a Frenchman from the interior of Yucatan. On this is a regular elongated Egyptian cartouche, with five symbols, which do not appear to me to have any relation with New-World-glyphs; this I look upon as spurious.

NICARAGUA.

For this country, I have recourse to Squier's *Travels in Central America and Nicaragua*. Squier thinks the ancient inhabitants of Nicaragua may have been of Toltec stock. "That the monoliths of Subtiaba resemble those of Copan;" but I may observe, there is nothing of the Copan character of hieroglyph on them. Page 327. On idol No. 1 is a symbol approaching the Maya *eznab*, "magician". Page 408. Here are figures approaching some seen in Mexican rituals. Vol. ii. Lines and dots are observed, probably intended for numerals. Outlines of figures, generally more like those of Chiriqué than of Copan, and not very ancient. Figures of circles predominate. Squier supposes that the Nicaragua monuments were erected by a people the Spaniards found there, and their language, the Niquiran, brought in by a colony from Mexico.

Page 347. The aborigines of Nicaragua had MSS. which the

Spaniards called books, painted in black and red on deer-skins; they were a hand's breadth or more in width, ten to twelve yards long, and folded like a screen. Oviedo observes, "though these were neither letters nor figures (Spanish), they were not without their meaning."

Chiriquí in Veraguas.

I refer, for accounts of antiquities connected with the present subject, to Dr. Seemann's *Voyage of the Herald*, 1848, *Trans. Amer. Ethno. Soc.*, 1853, to my *Ethnological, etc., Researches in South America* (Trübner, 1860), and to a paper of mine on Chiriquí, *Trans. Ethno. Soc.*, London, 1863. It would seem that the tribes of Veraguas have some connexion with those of Nicaragua. At page 30, of my *South American Antiquities*, I give details and plate of the Piedra Pintada, or engraved rock of Caldera in West Veraguas. Every part is covered with figures representing the sun, a series of heads, scorpions, and several symbols. At p. 155, same work, I allude to examples of symbols on ancient vases; but there is nothing approximating to the Maya. South of Chiriquí, and having crossed the river Atrato, old Spanish writers state that the people of Zenu had books with writing. I know of no example.

New Granada.

At p. 34 of my *South American Antiquities*, I allude to very ancient carvings on stone, at Timaná; some are of animals, and may have had to do with a calendar. At p. 40, I state that about Nieva, according to Velasco, there existed stones, on which were cut in relief strange characters at various angles, figures of animals, flowers, and figures that looked like numerals, these I call pre-Chibcha. Not very far south is the country of the Panos, who had their MS. books, details of which will be given when treating (in another paper) on the ancient writings of Peru. At p. 32 of my same work, I give details of the later Chibcha, or Muizca period, of N. Granada, and of their calendars, with symbols of frogs, notched sticks serving as numerals, snakes, circles, gnomons, human figures, heads, fish, insects, bows and arrows, etc. However, all that has been preserved of the Muizca writing are the representations of the numerals

1 to 10 and 20, which are of merely figurative origin, and have no connexion with the Maya.

Conclusion.—Comparing the Maya, Palenqué, and Copan hieroglyphs with those of Nicaragua, I find no connexion with the latter; what there is in Nicaragua, may be some early Toltec engrafted on aboriginal glyphs, of purely figurative character. The more ancient glyphs of Chiriquí, as well as later ones, are peculiar to that region. With regard to New Granada, there was a pre-Chibcha period, of which there are graphic records. In later times, there was a system of figurative symbols, particularly for the working of the lunar calendar, numeration, and other purposes. At no distant date, I hope to lay before the Anthropological Society a detailed examination, by the Maya alphabet, of the Dresden, Paris, and Madrid Yucatan Codices.

XXI.—*Report on the Researches of Dr. Edouard Dupont in the Belgian Bone-Caves on the banks of the river Lesse.* By C. Carter Blake, F.G.S., Hon. F.A.S.L., Associé Étranger de la Société d'Anthropologie de Paris, Corresponding Member of the Sociedad Antropológica Española, and of the Anthropological Section of the Société des Amis de de la Nature de Moscou, Lecturer on Comparative Anatomy at Westminster Hospital.

It will be in the knowledge of many anthropologists that excavations have been carried on for the last two years in the province of Namur, and that M. Dupont has been commissioned by the Belgian government to superintend work which has been defrayed at their expense. Several writers have published accounts of these discoveries, and some of these accounts have been without the sanction of the gentlemen to whose labours all the value of the present facts is due.

It has been known for a long while that remains of man and of extinct animals have been discovered in the caves in the neighbourhood of the village of Furfooz, near Dinant. These discoveries have been more or less communicated to English readers, by several notices which have appeared in the weekly press. It was therefore thought necessary by the Anthropological Society of London to adopt the suggestion made to them by their active local secretary at Brussels, Mr. John Jones, and to send a delegate to the Wallon caves, for the purpose of making a detailed report in conjunction with M. Dupont. That pleasurable duty devolved on me; and on the 5th of July, 1866, I left London for this purpose, and after consultation with our representatives at Brussels, arrived at Dinant on the evening of the 9th July. M. Dupont, who had been made aware of the purport of my visit, received me with the utmost cordiality, and placed that information at my hands of which it will now be my duty to inform you.

Prolonged and numerous visits were made by me to the

various bone-caves in the Lesse valley, and I examined the whole neighbourhood with M. Dupont. During a part of my investigations, I was accompanied by our Vice-President, Dr. R. S. Charnock. The following are the names of the caverns on the banks of the Lesse. The Trou de Pont-à-Lesse; T. Magrite; T. de la roche-à-Penne; T. de la Loutre; Des Blaireaux; T. de l'ours; T. de la Naulette; T. de l'Hyène; T. de Chaleux; two other caverns at Chaleux; T. des Nutons; T. de Frontal; T. Rosette; T. qui Igne (qui fume); T. Reuviau; T. St. Barthélemy; T. des Allemands; T. de Praules; and T. de Gendron (the latter belonging to the age of polished stone). In order that my readers may receive a clear knowledge of the principal features of the district, and attain definite ideas as to the evidence of human occupation of the caves, I shall here quote from Dr. Dupont's first report to the Belgian Minister of the Interior. Herein will be found the leading facts with regard to the Trou de Nutons, and that of the Frontal, near Furfooz.

From the *Moniteur Belge*, Jan. 24, 1865.

Report addressed to the Minister of the Interior on the scientific excavations made in the Province of Namur during the year 1864.

Monsieur le Ministre.—I have the honour to render you an account of the results of the scientific excavations which you have charged me, at the request of the Royal Academy of Sciences, to execute in the caverns of the province of Namur. I have commenced operations by the exploration of some caverns on the banks of the Lesse, in the neighbourhood of Dinant. This river flows through a narrow and deep fissure. Its precipitous banks still present, at many points, traces of primitive nature, such as we like to imagine as existing at the period when man, retired in caves of the rocks, lived on the products of hunting and fishing, in a state of barbarism, which recalls that of the least civilised tribes of America and the Indian Ocean.

The Lesse first traverses, not far from its source, the celebrated grotto of Han, which yearly attracts so many visitors. It soon enters amongst the schistose and quartzose rocks

(known in the country under the name of *agauches*), the barrenness of which, so energetically encountered elsewhere by the inhabitants, ranks this country amongst the Ardennes regions. The river advancing forms numerous and elegant windings between two encampments, covered with thick woods, in which are still living wolves, wild boars, and stags; it traverses the royal domains of Ciergnon and of Ardenne, and subsequently again encounters the calcareous rocks on the limits of the commune of Furfooz.

The aspect of the valley then becomes magnificent; the rocks, rising vertically, showing their greyish masses covered with parasitic plants amidst a vegetation of birch, oak, hazel, and eglantine; at intervals, sometimes on one bank, sometimes upon the other, fair meadows extend themselves between the inaccessible walls of marble and the limpid river, which forces the rocks to yield to its caprices.

It is at this spot where nature has displayed her luxuriant beauties, that in old time and at different intervals man established his habitation,—it is there, in fact, that the conquering Romans constructed a formidable fortress, which was utterly overturned by the invaders of the old empire of the world; and there, too, that the aboriginal tribes fixed their abode previous to their destruction, not by man, but by one of the most terrible of natural elements,—by water torrents.

The Roman fortress of Hauteraiscenne is built upon a tableland of small extent, and almost inaccessible. On the south, abrupt rocks, more than a hundred metres high, rise perpendicularly, and the Lesse flows at their feet. A very deep ravine separates it completely, on the north, from the neighbouring plateaux. This ravine is scarcely a hundred metres* distant from the river; and these rocks rising in the peaks of twenty metres above the narrow ridge which unites them to the mountain, isolate the camp to the east. The legionaries, doubtless, did not consider themselves sufficiently secured by this natural obstacle; they constructed there a redoubt, which may still be clearly traced, and hollowed in the rock a deep fosse, to add to the natural difficulties of the places.

* The metre = 1·093633 yard.

It is especially upon the west side of the camp that they accumulated defences. From the redoubt in question, the plateau slopes gently towards the Lesse, so that in a space of from seven to eight hundred metres it descends insensibly to the level of the river; in one certain point only it presents an elevation (*mamelon*), with an abrupt edge. This surface was too large for a post of this importance; therefore, the defences were circumscribed within a space of forty to fifty ares.* The Romans chose for this purpose a place where the encampment of the Lesse and that of the ravine are separated by a length of but fifteen metres at the most, and they constructed there four walls in masonry, cased internally and externally with rudely dressed stones. Two of these walls are yet visible.

In addition, vestiges of advanced fortifications may be seen upon the greater part of the plateau. A trench with an earthen rampart, cut across its entire width, formed an outer camp, intended, according to M. Hauzeur, to protect from surprise the camp followers and the herds when they were not pressed by the enemy. It has yet to be learnt at what period of the Roman occupation this formidable fortress was established.

M. Nicolas Hauzeur, who has unravelled with so much talent the history of this period, so unfortunate for our countries, has arrived, with regard to the position of Hauteraisenne, and of all the Roman establishments of the province of Namur in general, at the most satisfactory conclusions, and as he has permitted me to make them known, I am going to endeavour, M. le Ministre, to sum them up here.

When the legions led by Cæsar subjugated our countries, this land was held by a system of occupation analogous to that which the French at present employ in Algiers to secure the subjection of the people whom they have conquered. Around central points they established, at short distances from each other, a number of small posts of observation, which, in the event of the rising of such or such subdued people, fell back rapidly, and gave in a short time the alarm to the points most strongly occupied. These secondary posts have been recognised

* The are = 3·95 English poles.

by coins, broken pottery, arms, &c., which cover the soil of their sites, and they were so numerous that in the district of Ciney alone, a place which appears to have been a central point, M. Hauzeur has found, in not less than forty different localities, Roman antiquities of the two first centuries of the Christian era.

Towards the commencement of the third century all this country was ravaged; the towns and other positions burnt and razed. This was the result of a first irruption of barbarians from beyond the Rhine. Amidst the ruins of these habitations, in fact, only coins earlier than the reign of Galienus are found. A certain space of time afterwards elapsed previous to the return of the Romans to these localities; for few coins are found of the middle of this century, but a great number belonging to the end of the third and commencement of the fourth; a fact which shows that the legions returned only towards the close of the upper empire. But times were then changed; always kept on the alert by the barbarians, who were continually endeavouring to pass the Rhine, they had to employ the most available means to resist them energetically. It is no longer, therefore, in the positions most favourable for the establishment of their habitations, that M. Hauzeur finds the remains of this period.

They constructed their fortresses in inaccessible places, where they could only with difficulty procure the necessaries of life. Their constructions no longer exhibit much of their former splendour; they serve only for defence; no more vestiges of that celebrated symmetry in the arrangement of their camps; the difficulties created by art are added to natural obstacles to render these fortresses impregnable positions. The fortress of Hauteraiscenne is one of this kind; I am about to describe its situation, and to show how this position, with the artificial obstructions which are accumulated there, was fitted for a vigorous defence. Like all the other positions of the Romans in this country it gave way before the torrent; this laid waste all and the Franks came to settle amongst ruins. The camp of Hauteraiscenne has not yet been regularly explored; some medals of the era of the Constantines and some pottery, are

almost the only things collected up to the present time. The flanks of the escarpment, upon which it is constructed, have no less than fifteen caverns, more or less deep, and in these I have commenced the scientific excavations which you have entrusted to me. Two only in the country bear names which seem to relate to the fortress; it is that of the *gatte d'or** (golden goat), a name which is given to all places where vestiges of ancient buildings are found. It is especially diffused in the neighbourhood of the ruins of feudal castles, and it is established in the belief that, at the moment of the taking of the castle, the besieged hid their treasures in the most secret places. The defenders of the camp of Hauteraiscenne, according to the legend, would have deposited theirs in the grotto of the *gatte d'or*. Another grotto which, M. le Ministre, I shall shortly have to notice from another point of view, is that which is called in the country the *Trou des Nutons*. A great number of caverns in the country are so named, and a legend respecting them is preserved amongst the people.

The Nutons would appear to be little men, able to work in metals, to shoe horses, or to make baskets; they inhabited caves and left them only during the night. The inhabitants brought to the entrance of their subterranean habitation their implements which required repair, and deposited as payment some bread, of which these mysterious beings were particularly fond; but one day, says the legend, they mingled ashes with the dough, and the Nutons, in their indignation, quitted the country for ever. This legend occurs again in Hainaut, in the province of Liege, and even in Scotland, if one be willing to see in the romance of *Kenilworth*, by Sir Walter Scott, the history of a Nuton adapted to the requirements of a romance writer. It would not be impossible, moreover, according to one of my friends, M. de Reul, to trace this same legend into Norway, Germany, and Italy. It appears to me that all to be learnt from these details, is, that the Nutons are the remnant of a proscribed race, who may have taken refuge in the safest places, and who endeavoured to live there by skill in arts unknown to

* Anglo-Saxon, *gat, gaet*, a goat.

the inhabitants of the country. Are the heroes of the legend diffused through such different and distant countries of the same race? This is a subject which must be left to the historian.

As regards the Nutons, who inhabited Belgium, M. Grandgagnage is inclined to believe them to be the first missionaries of the country. Might they not, with greater probability, be considered to be Gallo-Romans who had escaped massacre, taking refuge in caverns; seeking to procure food without endangering their safety, by impressing the superstitious spirit of the barbarous populations; by employing their industry in mysterious ways; and forced to quit the country by vexations of all kinds. Or, again, might they not have been some representatives of that race of Indian origin wandering about the world for some thousands of years; establishing themselves in rock-excavations; procuring the most necessary articles by selling baskets, tinning household utensils, shoeing horses, telling fortunes, and even now the object of the contempt and animadversion of our race: in other terms, might they not have been the gipsies, or Bohemians, when they made their first appearance in our country? This opinion, suggested by M. de Reul, is certainly that which best accounts for circumstances, and, for my part, I avow that I do not see any very serious objections to it.

The first grotto in which I have searched for the remains of the animals which peopled our country in the latest geological times, is precisely this *Trou des Nutons*, at Furfooz. It is hollowed in the flanks of the escarpment upon which the Roman fortress is built; turned towards the south, it opens opposite the Lesse, which flows at its feet, in the midst of one of the most charming landscapes in the country.

It is a long passage, wide open, in which rocks, and not stalactites, form figures and veritable draperies, covered in many places with delicate green mould. The ceiling shows two vast domes *aux contours singuliers*; the sidewalls, elegantly scooped into large receding masses, make of this cavern one of those works where nature displays the plenitude of her inimitable caprices. It is bare rock; the stalactite, which is of daily

formation in most caves, and which, as so well known to the visitors of the Grotte de Han, no longer oozes from its walls. The marble, with its severe tones,—the protococcus, with its green tints,—the yellow colour of the clay in the portions worked,—the strong and hard lines of the fractured rocks,—the clear and sharp shadows of their figures,—the movement and animation which this cavern, so long abandoned by man, presents to-day under active examination,—the interest, the emotion, the continual expectation of some antediluvian objects carrying us back to the first ages of humanity, and even to far earlier times,—besides the legend of the mysterious inhabitants of the grot which recurs to the mind,—such are the objects and sentiments which impress the visitors of the Trou des Nutons.

I first caused to be removed the superficial layer of the cavern; it was of black colour, and contained mixtures of objects of human industry of an antiquity more or less remote. M. Hauzeur recognised amongst them money and glazed pottery of the last century; some pieces of vases of the middle ages; some objects referrible to the Frankish period; fragments of arms, phials in glass, and pottery; a belt-buckle, perfectly well made, etc.; some medals of Domitian and Antoninus; fragments of vases and Roman tiles; some objects in bronze; the end of a bow; a spoon; the clasp of a toga; a pin, etc.; some horses' bits, and different utensils in iron; finally, a bead in pottery, which M. Hauzeur refers to an age prior to the Roman occupation. I subsequently cut into the subjacent layers; a bed, of two metres in thickness, composed of red argillaceous earths, covered the whole grot. It contained an enormous quantity of large limestone blocks, dispersed through the whole earthy mass, and mingled in a state of confusion scarcely credible, with a great number of bones and objects of human industry. M. Van Beneden, member of the Royal Academy of Sciences, has been kind enough to determine the species whose bones I have collected, and it is under the high guarantee of so illustrious a *savant* that I name the fauna of our country at a period so remote.

The *reindeer*, represented, besides the different pieces of

the skeleton, by more than one hundred and fifty horns; the greater part have been broken by the violence of the water which carried the earth and blocks of stone into the cavern; I have, nevertheless, received several well-preserved specimens. The *glutton*, an animal allied to the bear, now only found in the coldest regions of the two continents. The *bear*, which, after the fullest examination, appears to be the brown bear at present found only in the Pyrenees, the Alps, Sweden, and Siberia. The *chamois*, the agile inhabitant of the snowy crests of the Alps, is represented by several fine relics. The *elk*, whose habitat is restricted to the Arctic regions. The *stag*, which still lives in our woods of the Ardennes, is very rare. The *fox* appears to offer two varieties, judging from size and other characters. The *wolf*, which ranges from Egypt to Lapland. The *horse*. The *ox* (*Bos primigenius*), or the *Urus* of Cæsar; it has, it seems, entirely disappeared. The *wild goat*, which inhabits the most elevated summits of the mountains of Europe. The amphibious and common *campagnols*. The *grouse* (*Coq de bruyères*), which, like the stag, has remained in the Ardennes, but whose principal habitat is also in the north. Fifteen other species, at least, the enumeration of which would be less interesting, were found also entombed in this argillaceous earth.

A great number of relics of human industry have been exhumed from amidst this ancient fauna, so strange to our country; they consist of cut flints. These are flakes, flat on one side, and with three faces on the other, split by a very adroit blow from silicious masses found in our localities, where they are known under the name of "clavias". These instruments present two types; the one, and that which is most commonly met with, is a flake from four to ten centimetres long, and one and a half to two centimetres wide, very sharp at the edges; I have not collected less than two hundred and fifty of them from the Trou des Nutons alone. The other type is rudely squared, of two centimetres on a side. Lastly, I have found a great many of the spoils of the manufacture of these instruments. The first type is known under the name of knives; they are found in the whole of western Europe as

evidences of the first industry of man upon this part of our continent, at an epoch when the climate and the fauna differed remarkably from those of our days. I have, besides, found some wrought bones. The first is the tibia of a goat. This bone of the leg has been broken at one end, and cut as a flute at the other; it is a whistle, from which sharp sounds can still be drawn. Afterwards, two small bones of the goat (*astragali*) polished on two of their surfaces, and entirely identical with those which children still use in their play. It is, then, to the antediluvian people that we owe the discovery of this toy, the truly primitive simplicity of which is in due relation to the slightly advanced civilisation of our aborigines. I have also collected there needles, daggers, arrowheads, etc., evidencing a quite primitive degree of art; fragments of vases in pottery made by hand, and of manufacture so rude that an idea can scarcely be formed of it; the remains of fires at which the primitive inhabitants of the Trou des Nutons cooked their repasts; finally, a great number of bones of the limbs of the horse, ox, reindeer, etc., all broken longitudinally for the extraction of the marrow.

Such is the very remarkable ossiferous layer which I have explored in the Trou des Nutons, at Furfooz. It rested upon a bed of stalagmite, admirably homogeneous, more than a foot thick, which uniformly covered the grotto over three-fourths of its extent. Under this stalagmite lies a great deposit of sand and clay, well stratified, not containing bones, so far as known; it is more than six metres thick; I am at present occupied in working it, and I shall have the honour, M. le Ministre, soon to render you an account of the result of my researches.

At about two hundred metres below the Trou des Nutons, the escarpment which borders the Lesse affords a new grotto. It is like its neighbour, wide at the opening; its entrance is likewise surmounted by eroded (*decoupés*) rocks; but it is a great deal smaller. It is divided into two chambers; the exterior hardly six metres in depth; the other, which opens at the bottom of the last, is a small deep passage, three metres wide and two metres high. This cavern contained a rich de-

posit of human bones, which take their place, I think, amongst the most interesting palæontological discoveries made in Belgium up to the present time.

On the 22nd of November last, profiting by a moment when I could not employ all our workmen at the Trou des Nutons, and when my presence there was not necessary, I visited, with two of them, this small cave. The passage at the bottom was completely obstructed by large stones, which choked the entrance. I confined my operations, therefore, to the outer chamber. Its floor was covered with fragments of rock, to the thickness of more than two metres. I had it dug into, and at the depth of thirty centimetres, we found all the vertebræ, with the ribs, sternum, and pelvis of a bear; then some pieces of the skeleton of a goat. It was just when night was compelling us to quit the grotto, that I found amongst the stones a human frontal bone, well preserved, belonging to an individual of fifteen or sixteen years old. The cavern took its name from the circumstance. Some days afterwards, M. Van Beneden visited these places at my invitation; some human limb-bones, and a great number of animal bones, were the fruits of a brief exploration.

As I desired that these discoveries should have all possible authentication, I requested M. Van Beneden to return at his earliest leisure, engaging not to continue the diggings until several *savants* could be present. On the 10th of December, four of us were at the cavern, Messrs. Van Beneden, Hauzeur, De Reul, and myself. I caused the small gallery at the end of the excavation to be opened; a man, lying flat, squeezed himself in, and found there a jaw, and other human bones. The aperture was enlarged, and we could judge of the importance of the ossuary which revealed itself to us. An enormous number of bones of our species, in a state of incredible confusion, were driven between large stones, and surrounded by earth; it became evident to all that a violent cause only could have placed these bones amongst them.

We removed, ourselves, the earth and stones with the greatest precaution, and very soon a sight, still more unexpected, presented itself. Upon a space of about half a metre square,

were found exposed two entire skulls, well preserved, and bones of every kind,—shoulder-blades, ribs, vertebræ, limb-bones, etc., the whole belonging to beings of our species, disposed in inexpressible disorder. The quantity of bones we found that day was so great that two men could hardly transport them to Dinant. The next week nine members of the Archæological Society of Namur came to verify the facts relating to the position of these bones, and M. Van Beneden invited, in my name, the Academy of Sciences to assist at the exhumation of these remains.

On the 26th Dec., six *savants* were present. A considerable number of bones were again taken out of the cavern, and each could theorise for himself upon their high antiquity, and the cause which had thrown them into this state of disorder. It was, in fact, unanimously admitted that these skeletons might be referred to the age when man, ignorant of the working of metals, only used instruments of stone, and that they had been mingled with stones and earth by a great inundation. The human bones found in the Trou du Frontal belong to not less than thirteen individuals of all ages; there are some belonging to infants of scarcely a year old. A considerable number of flint instruments were accumulated, as well as instruments in bone, a needle, tips of arrows, etc. I recognised there a whistle, quite different from that of the Trou des Nutons, which I previously mentioned. It is a phalanx of the reindeer (which bone of the foot is hollow, as is well known, in some ruminating animals). A small hole had been pierced in the midst in such a manner that, upon applying the articular surfaces to the lips, a sharp sound could be produced. This discovery has some importance, because the French *savants* have collected identical specimens in the human bone caverns of the Pyrenees; and when we recollect likewise that the flint instruments present the same form in the two countries, we are brought to admit that, in that remote period, there existed a great similitude of manners between peoples so distant one from the other.

Another discovery, which tends to throw some light upon the manners of these ancient inhabitants of our country, was

that of several objects which we are brought to consider as amulets. In the first place, there is a fossil shell, longitudinally spiral, which comes from the French secondary formations, distant at least fifty kilometres. A hole is bored through it by artificial means, through which a cord may be passed to suspend the object. Then a fine piece of a transparent violet-coloured material, called in mineralogy *fluorine*, and cut very regularly, is found mingled with the human bones, and, like the other object, appears to me to have come from France, but only from a point about fifteen kilometres distant. The number of remains belonging to animals is also very great, and all seemed to indicate that they are the remains of the repasts of the aborigines. M. Van Beneden has recognised amongst them the reindeer, the horse, the ox, the bear, the wild boar, the grouse, etc.

I am not yet in a position, M. le Ministre, to give you precise information upon the races to which the men buried in the Trou du Frontal belong. I hope, however, that this question, so full of interest, will be elucidated within a short time; I shall then have the honour to let you know the opinion of the very competent men to whom it will be submitted.

Another question afterwards arises, How came human skeletons in the cavern of Frontal, just when the waters precipitated themselves there and mixed up the bones, the earth, and the stones. With regard to the solution of this delicate problem, we have to felicitate ourselves that the explorations have taken place before a number of highly competent witnesses. As several *savants*, amongst whom I will mention Messieurs Van Beneden and Hauzeur, have adopted the explanation which I have proposed, I shall endeavour briefly to state it.

We believe that the inner gallery served as a burial-place to the population of this country, at a time when the reindeer lived in our forests, and our people were still in a state of the greatest barbarism. They have placed there, either at the same time or in succession, at least thirteen corpses, and have closed the entrance of the cavern with a large slab, which I have found below the opening, which it fitted perfectly, so

that the corpses were protected from the voracity of wild beasts.

An analogous burial-place was noticed in the south of France four years ago, by a celebrated French anatomist, M. Lartet. Seventeen skeletons were discovered there, unexpectedly, by a curious working man, and had been knocked to pieces by an ignorant population. M. Lartet, when he visited the spot eight years later, could only verify the different circumstances connected with the period of the inhumation, and the circumstances which accompanied it. He concluded that a great funeral repast had taken place before the sepulchre, made by a people who used only stone utensils, and who existed at an epoch when the country was inhabited by animals quite different from those now existing. Ought we to apply to the burial-place of Furfooz this opinion of the French *savant*, to explain the remains of feasts in the exterior chamber of the cavern? It is at least seductive. If now we seek to make a history of the phenomena, of which the two caverns of Furfooz and the surrounding country have been witnesses during this remote period, we shall arrive at some interesting conclusions as to the antediluvian history of our country,—a history still involved in the most profound mystery.

I like to imagine to myself our mountainous regions of that epoch, with their hoar-frosts, their forests, their inhabitants, so different from those now existing. The fine rivers furrowing our hilly countries were covered with ice during several months of the year; the oak, the birch, the pine, and the hazel, adorned with their sombre verdure the rugged escarpments and were laden with snow and hoar-frost during a long season; the reindeer united in great herds; the elk, with wide-spreading and branching horns, filled the forests; the horse and the ox grazed the tufted herbage never harvested by man; the chamois bounded from rock to rock; the bear, in its squat forms, nourished itself in summer on succulent roots and the young shoots of trees, and passed the winter in lethargy; the glutton with its rapacious instincts, wolves and foxes innumerable, brought scenes of carnage amongst these gentle and peaceable inhabitants of our forests. And, in the midst of this natural scenery,

partaking at the same time of the character of the Alps and of the Sweden of our days, appeared man, not endowed with those magnificent attributes of civilisation which render him, to some extent, master of all the elements, but in a state of the most complete barbarism.

The rocks furnished him with shelter in their sombre cavities; the skins of animals served to clothe him; unceasingly in quest of food, he passed the day in the rime-clad forests, chasing wild beasts. His industrial productions indicate a quite rudimentary civilisation; neither copper, iron, nor any of the metals which constitute the power of existing society were known to him; flints rudely worked, and bones cut to points formed both his arms and his domestic utensils.

All seems to indicate that his manners assimilated much to those of the Esquimaux; the long bones of ruminants are split longitudinally, and show that, like the Arctic people, fresh marrow formed their feasts; they have still this trait, in common with them, that they lived in the most filthy state, allowing to accumulate in their habitations the greater part of the remains of their repasts. All animals furnished them with food, but the reindeer, if we may judge from the enormous quantity of remains found in these caverns, was particularly esteemed. They have eaten indifferently a great many wild boars, horses, grouse, pike, trout, etc. Fire was known to them, as proved by the traces of fires and the remains of burnt bones collected by me. And how could it be otherwise? There was a time, certainly, when man was unacquainted with fire; lightning and volcanoes, doubtless, revealed it to him. We ought probably, as a celebrated Swiss archæologist has remarked, to see in the perpetual fire so religiously preserved in ancient times, a proof of the difficulties which the first people experienced in obtaining it, and how much they appreciated the importance of this element.

It is probable that, only after this progression, the true point of departure of all civilisation, man was able to inhabit cold countries. It is, then, during the lapse of this second period of human industry that he settled in our regions, and to it we must refer the remains which he has left us in the caves of Furfooz. But very soon a great disaster terminated these first

ages of our species. A frightful inundation entirely covered the country; all was ruined; the forests were destroyed, animals and men alike annihilated. The force of the current was such that rock masses, which a man can hardly move, were transported to a distance; the waters, forcibly entering the *Trou des Nutons*, produced by their collision the fall of the way to the entrance of the cavern. The masses of stone produced by this colossal disruption were mingled with the mud deposited by the waters, and with the large quantity of bones forming the remains of the repasts of the inhabitants of the caves. The same thing has taken place in the cavern which served them for sepulture, and the great scattering of human bones amongst the rock fragments is the result of the violence of the current. At the same time the water rats, driven by this mighty flood, sought in vain a refuge in the fissures; several hundreds perished in the grots of Furfooz, and their bones were scattered in the mass of earthy deposit. The number of their remains is so prodigious that they form one of the most characteristic traits of this yellowish-red clay bed, covering the surface of all the caverns where I have made borings.

The indescribable confusion which prevails in these deposits, it is evident, can only be explained by causes analogous to those now operating in nature. The elevation of the *Trou des Nutons* above the *Reliage de la Lesse*, which is thirty-three métres, may be nearly two hundred métres above the present sea level, and that of the *Trou du Frontal*, which is eighteen métres, puts them, in fact, completely out of the reach of the highest floods of this river. Do we see there the traces of that terrible phenomenon of which all races have preserved the remembrance? All I can say in this respect is, that the inundation of which I endeavour to describe the disastrous effects, is the last which reached the summits of our table-land. All was subsequently restored to order; the soil was covered anew with a vigorous vegetation; animals and man reappeared. The climate, meanwhile, was very different from what it had been; many animals which formerly inhabited our regions were banished, some to the heights of the Alps and Pyrenees, some towards the Polar regions. The stag, the roebuck, and the fallow deer replaced the reindeer, the elk, and the chamois; man still made use for

some time of flint for his instruments, but he polished it and made it into more useful utensils. Belgium had subsequently, like Switzerland and Denmark, its age of bronze, as proved by the intelligent researches of the Archæological Society of Namur. Iron was at length introduced and civilisation could take its full flight.

Such are up to the present day, M. le Ministre, the results of the mission which you have deigned to confide to me. The national protection which is given to these scientific operations, and the grand thought which has suggested it, enables us confidently to predicate the crowning of the work.

EDOUARD DUPONT,

Dinant, *Jan.* 12, 1865. Doctor of Natural Sciences.

I next shall quote from Dr. Dupont's description of another typical cave, the "Trou Rosette":

"At the summit of the escarpment, where the ancient people of Furfooz fixed their habitation, and immediately above the Trou du Frontal, which served as a burying-place, is a cavern called the Trou Rosette. It is divided into two small galleries, about five metres in length and two in width, running parallel, and communicating by a large and nearly circular opening. The total height is about four metres, and it was filled to a depth of three metres with yellow earth and stones. Only one of the openings was sufficiently large to admit of an entrance, and neither bones nor worked flints were visible. When, however, the workmen had excavated as far as the opening into the other gallery, these objects were discovered in abundance. Bones of animals were found mingled with those of man, and a careful exploration brought to light a human skull, crushed between two blocks of stone, and a number of bones and flints embedded in the yellow clay. It was, in some respects, a repetition of the spectacle of the 10th of December last. My first care was to stop the work, and to invite M. Van Beneden, and other scientific men, to corroborate the authenticity of this new discovery. M. Van Beneden at once recognised the remains of the reindeer, beaver, and other animals, associated with human bones, which were those of three individuals, one apparently an infant, and another perhaps about twenty years

of age. Industrial objects were rare in this new cavern; I only found some pottery, but no flints or cut bones. The pottery was similar to that discovered in the Trou des Nutons and in the Trou du Frontal. It was of black clay, containing calcareous grains. It was of hand manufacture, and was, in some cases, marked with coarse furrows. It had only been partially hardened in the fire. The men of the Trou Rosette were therefore nearly contemporaneous with those of the Trou du Frontal. They lived principally on the flesh of the reindeer; their tools were flakes of flint and cut bones, and their utensils were of unbaked clay. Their dead were deposited in rock cavities, closed with a flat stone; and they were destroyed by the inundation, of which the clay of our fields furnishes such indisputable evidence.

"It may be asked whether the Trou Rosette served as a place of sepulture, as was the case with the Trou du Frontal. I do not think so. These human bones were collected together in one corner of the cavern, crushed by large stones, and were not in that state which would lead us to suppose that the skeletons were there when the waters burst in. I believe, on the contrary, that the bones were still clothed with flesh; that the corpses were, so to speak, pounded by the enormous masses of rock, transported or dislodged by the current. The absence of flint weapons and objects which we must look upon as amulets, corroborates this view of the matter, as does the absence of the stone slab, which would preserve the corpses from the attacks of wild beasts. Were I compelled to give an opinion on these human *débris*, I should be inclined to recognise in them the results of one act of the terrible drama of which our country was a witness, when every living thing in those regions perished by the waters.

"It is unnecessary for me to enlarge upon the grandeur of this catastrophe, or upon the facts by which its occurrence is proved. An inundation which covered the summits of our *plateaux*, more than two hundred metres above the level of the sea, and deposited upon them a thick layer of yellow sediment, is an event of which we must be prepared to find traces whenever we study these remote epochs. We have already seen how it scattered

the human *débris* in the other caverns in the neighbourhood of Furfooz. The Trou Rosette, in my opinion, shows us how the wretched inhabitants, to escape the danger, sought refuge on the *plateaux*. In their terror they imagined that shelter might be found in the gloomy cavern, where, however, they met their death in the midst of the waters."

The quaternary stratigraphical series is composed, in the province of Namur, of two pebble beds, each of which is capped by a deposit of mud.

The *lower pebble bed* is formed of stratified rolled pebbles, derived from the rocks situated in Amont; and is associated with sand and gravel. It is surmounted with sand and clay, commonly alternating in thin layers with irregularly disposed veins of rolled pebbles and of sand. These veins are often replaced in the caverns by beds of stalagmite. The name of *lehm* has been given to this deposit of mud.

The upper pebble bed is composed of angular pebbles, disposed pell-mell in a sandy paste, and derived from the immediately neighbouring or subjacent earth. This deposit has much raised the lower beds; it is usually covered by a siliceous mud (ninety per cent. at least of silica) of a fine substance, and unstratified. This is the brick earth, or loess, properly so called.

The *angular pebbles* and the *loess* do not show any relation with the orographical conditions of the country. They cover it over its entire contour.

The *rolled pebbles* and the *lehm* are, on the other hand, in intimate relation with the hollowing-out of the valleys of which they are the consequence.

A section, taken on a natural terrace on the banks of the Meuse at Agimont, near Givet, and at a height of thirty-five metres above the river, indicates these deposits with their principal characters and accidents.

To the end that I may give, before the more detailed examination of the principal caverns excavated by M. Dupont, a more clear idea of the composition of the ground in which, at the first glance, so much mystery appears to prevail, I shall here point out that the composition of the quaternary soil in the

caverns of the province of Namur is the same as externally. Every deposit is identical, but these caverns, having commonly narrow openings, the aqueous phenomena which have given birth to these deposits, have not always those evidences inside which on the outside are presented. The section of the Trou de Frontal at Furfooz is complete, with the exception of the loess, which is therein badly developed.

As the quaternary beds are generally ossiferous in the caverns, it is therein that the palæontological character of the beds should be examined. The caverns have served as lairs to hyænas, foxes, bears, badges, or even have been the habitation of man. The external part rarely contains bones.

The rolled pebbles have only as yet exhibited in the province of Namur some remains of Elephas primigenius, Ursus spelæus, horse, and beaver. But the mud which lies below these contains a rich fauna, whose characters agree entirely with that of the fauna of the rolled pebble beds; which demonstrates, as well as the stratigraphical evidence, that these two beds are intimately connected.

The fauna of the lehm is composed as follows:

Extinct species.	Emigrated species.	Species destroyed by man.	Species now existing in the country.
Hyæna spelæa	Cervus tarandus	Ursus arctos	Canis vulpes
Ursus spelæus	Equus caballus*	Two large species of Bos	Canis lupus
Elephas primigenius	Marmot		Meles taxus
Rhinocerus tichorinus.	Chamois		Arvicola amphibia
			Bat
			Sus scrofa
			Cervus elaphus

Man inhabited the banks of the Lesse at this epoch.

Thirteen caverns amongst the twenty-four which have been examined up to the present day, have furnished the fauna called that of the reindeer, always at the base of the deposit of angular pebbles.

The following is the fauna:

* M. Dupont thinks that the horse disappeared from the country at the same time as the reindeer, and that it was not again introduced till the bronze period, when it was domestic.

Emigrated species.	Species destroyed by man.	Species existing in the country.
Cervus tarandus	Castor Europæa	Cervus elephas
Cervus alus	Ursus arctos	Canis vulpes
Capra ægagrus	Bos taurus	Canis lupus
Antilope rupicapra		Meles taxus
Equus caballus		Arvicola amphibia
Gulo luscus		Vespertilio
Antilope saïga		Sus scrofa
		Capra hircus
		Tetrao tetrix

The Loess has not yet furnished any bones.

The caverns which contain bones above these beds produce a fauna entirely composed of existing species, and of some which have been destroyed by man. The following is the fauna collected in a cavern in the middle of *débris* of industry of the polished stone age: Sus scrofa, Cervus elaphus, Capra hircus, Arvicola amphibia, Tetrao tetrix, Bos taurus. When examined in a general manner, the quaternary beds of the province of Namur are formed of two series of deposits, which each indicate a separate epoch and distinct phenomena.

The first series is composed of rolled pebbles and of stratified mud, or lehm, which are fluviatile sediments deposited during the hollowing out of the valley. M. Dupont considers that the doctrine of Mr. Prestwich on this subject is entirely correct with regard to the Belgian beds.

This first epoch is then characterised by great fluviatile phenomena, which, according to their extent, sometimes hollowed out the earth, and sometimes deposited thereon rolled pebbles or mud. The fauna of this epoch includes extinct species, associated with species which have now emigrated to colder climates than our own.

The second series of quaternary sediments formed of angular blocks and of loess, is completely independent of the first, by its fauna, by its composition, by its geographical distribution, and by the phenomena which it presents. In fact, the fauna only presents the species emigrated from the previous fauna and the species now existing, to the exclusion of all extinct species.

Nothing indicates for the pebbly deposit a transport by water,

and it thus forms a great contrast with the lower pebble-beds. It extends, with the loess which caps it on the *plateaux*, over all the country; it was a great mantle of mud which extended over all the country; nevertheless it is evidently and entirely posterior to the first series of deposits, as the reindeer fauna is presented in its lower portion at every height.

Distribution of the principal *Mammalia* in the quaternary beds of the province of Namur.

	Rolled pebbles and lehm.	Angular pebbles and loess.	Recent period.
Elephas primigenius	———		
Rhinoceros tichorhinus	———		
Sus scrofa	———	———	———
Ursus spelæa	———		
——— arctos	———	———	
Hyæna spelæa	———		
Cervus tarandus	———	———	
——— elaphus	———	———	———
Antilope rupicapra	———	———	
Canis vulpes	———	———	———
Equus caballus	———	———	?

It appears that the brown bear yet lived in Belgium in the tenth century. M. Dupont is led to believe that the horse disappeared from the country at the same time as the reindeer, and that it was reintroduced in the domestic state during the bronze period; according to this view the horse itself will be an emigrated species.

In the open country, the succession of beds is essentially the same as in the caves. The following series can be recognised from above to below.

1. Made earth, with various objects, dating from the historic period.

2. Yellow clay, containing numerous angular fragments of limestone spread throughout the mass. It is in this bed that M. Dupont has found the greatest part of the bones, and the objects of human industry made in flint and in bone. The skeletons of man, reindeer, glutton, elk, bear, chamois, ibex, and beaver, are common herein. The remains of human industry are composed of flint knives, worked bones, fragments of coarse pottery, traces of hearths, etc. (chief remains from Trous de Frontal, des Nutons, and de Chaleux).

3. Bed of stalagmite.

4. Sandy, stratified clay-deposit (lehm), stratified and without pebbles or angular blocks; osseous remains rare; elephant, hyæna, and rhinoceros, have herein been found, as well as calcareous concretions. (Jaw from Trou de la Naulette.)

5. Beds of rolled pebbles, derived, as M. Dupont has pointed out, from the Ardennes. He found, also, a tooth of *Ursus spelæus*, and some remains of a horse.

6. Glauconiferous gravels, with traces of peaty matter, remains of beaver and other animals. No human remains.

All these beds cannot be recognised in each cavern; but can be found in the greater number of sections, as well in the caverns as in the open country. In this latter, the deposit (*argile jaune avec cailloux anguleux*) extends over the plateaux, where it is capped by *loess*, or upland *brick earth*. The occurrence of the angular pebble-bed below the loess, and its wide distribution, is a fact which is of great interest to geologists, as it points to the more or less violent action of some physical cause, since the men and reindeer, who were contemporaries, dwelt in the caves of Furfooz. The angular pebble bed is found both in the caves and in the open country. The superposition of this angular pebble bed over the clay, or lehm, which is immediately subjacent, is also a fact, which can be verified beautifully in the Trous des Nutons and de Frontal.

The stratification of the *lehm* deposit is again a fact, which can be excellently proved by examination of the Trou de la Naulette. In a letter which I have received from an eminent English geologist, some doubt is thrown on this fact, and it is suggested that the *lehm* is merely horizontally bedded. The examination of the deposit, which I have made with the greatest care, compels me to reject this *exegesis*. The layers of stratification in the Trou de la Naulette alternate with beds of stalagmite; and no geologist, who has seen this cavern, could for one moment attribute the formation of the lehm deposit to any other source than that of the slow deposition of river mud, such mud being, probably, deposited by the Lesse. The mineral condition of the remains of rhinoceros, hyæna, and elephant, perfectly agrees with that of the human remains.

The distinction between the remains found in the Trou de la Naulette and those found in the Trou de Frontal, and other Furfooz caves, rests especially on the fact that, in the latter cases, we have the human remains from the reindeer beds "containing the angular pebbles; in the former, the remains are beneath the deposit of *cailloux anguleux*, in deposits containing elephant, rhinoceros, and hyæna. Considerations, which M. Dupont has urged elsewhere, have led him to the conclusion that the *cailloux anguleux* bed was formed by some more violent and rapid action than that which produced the lehm. Into this theoretical consideration I will not now enter; suffice it to say, that visual inspection of the beds must convince the most sceptical of the slow and gradual deposition of the lehm.

In the Trou de Chaleux the traces of man exist in a bed of about 0·30 metres in thickness, formed of sand, dust, and earth, perfectly limited above and below and extending from the base of the escarpment to and over the greatest part of the cavern, as indicated in the figure at the level of the principal chamber and in the gallery situated at the extremity of the burrow; the bones and other objects left by man are mixed with yellow mud, because they were not protected by the fallen stones. This mixture is the general case at Furfooz for the same reason.

The remains left by man at this level are as various as numerous. They are the remains of animals who served as repast for man; several human bones; worked bones; various objects wrought by man; more than 30,000 flints, knives, splinters, nuclei, &c.; ashes from hearths; numerous fragments of sandstone, psammites, and schists. These objects were found on a surface of 75 square metres and in a very thin bed. They were covered by a thick mass of stones derived as was the greater mass from the fall of a part of the roof of the cavern; but this fall was much more considerable than the first one. In certain places it is three metres in height, and it extends with continuity to the Lesse. All is covered by the ordinary yellow clay. This contains several teeth and bones of horses and more than fifty flint knives, which can be easily

distinguished by the absence of the patina which is present in the worked flints of the bed interposed between the two fallen masses. The yellow clay has here, especially at the opening, a tint which is a little more reddish than in the other localities; I attribute this to alteration by springs from the stratified deposit which is found at the bottom of the cavern. It is surmounted by a greyish yellow sandy clay which is analogous to the loess. They both contain angular fragments of the limestone. Some modern insignificant objects have been collected on the floor of the cavern. The importance of the mass of stones which covered the ancient floor inhabited by the "flint-folk" can be easily conceived. While at Furfooz the remains of the human habitation had been mixed with yellow clay and mixed together violently by water, the soil of the cavern of Chaleux was yet found, when I examined it, in the condition in which it was left by the man of the reindeer period; because a mass of stones of three metres in thickness covered this soil immediately after its abandonment, and it had been thus protected for a long period against all disturbance.

From this consideration, it is evident that the objects whose origin was external to the cavern had been brought there by man before the *éboulement* had taken place. But in a science where all conclusions are generally received with scepticism, too many proofs cannot be accumulated. I shall, therefore, rapidly examine the bedding of the principal objects, and the manner in which they have been introduced in the cave. This examination does not leave any doubt of their introduction by man.

M. Van Beneden has up to the present time recognised eleven species of mammalia amongst the bones. These are, the reindeer, the goat, ox, horse, wild boar, brown bear, fox, badger, polecat, hare, and water rat.

The majority of these animals have evidently served to nourish man, and the bones collected in these caverns are nothing else but the *débris* of human repasts. The horse was the principal nourishment of these antique populations, as M. Dupont has been able to count 937 molar teeth which were left in the habitation of Chaleux. He only possesses from the cave one single

complete limb-bone, *i.e.*, the tibia of a young horse. All the others have been completely broken. I do not think that I exaggerate when I say that there are more than a cubic metre of fragments of bone, many of which, according to M. Van Beneden, bear distinctly the traces of cuts made with flint.

The Arvicola amphibia has left very abundant traces; they are found especially near the hearth, and it may here be the place to inquire whether these rodents did not form part of the human food. Several human bones have been also discovered, of which M. Van Beneden has given the following list:—"Separate teeth of which the curve is worn down to the cingulum, three scapulæ, two radii, a tibia, two fibulæ, an axis, rather strong lumbar vertebræ, two other vertebræ of a younger individual, fragments of ribs, and some digital phalanges. Since then I have found a fragment of the parietal, a cervical vertebra, and several other bones. All these bones are far from constituting, as may be seen, an entire skeleton. M. V. Beneden has also noticed that these bones are very tender, and that the scattered teeth clearly indicate that the bones of the head were completely decomposed on the spot.

It is in all these cases very difficult to explain the presence of these human bones. To apply to them the interpretation which M. Spring has given for the human remains of the age of polished stone found by him at Chauvaux would be unsatisfactory. None of them have been discovered in the neighbourhood of the hearth. The majority were found in a lateral depression of the cavern, mixed with bones of horses and foxes, who were the remains of these men's food. The fragment of parietal bone and of a cervical vertebra were found on the floor of the cavern under the same conditions. Besides these, the long bones, of which there are five, were entire. But as I have said above, all the marrow bones of animals of a certain size were fractured by man, one solitary tibia of horse being the exception. These human limb bones agree in all the other conditions with those discovered at Chauvaux by M. Spring; so that it seems to be very difficult to see in these incomplete remains of human skeletons evidence of the cannibalism of this ancient population.

Towards the middle of the cavern, on the inside of the parapet entered by the fallen stones, was a hearth which occupied a surface of not less than a metre and a half. This is proved by the charcoal, ashes, and burnt earth, and is the strongest proof of the habitation of this cavern by man at this epoch.

In the middle of this, cinders and charcoal, numerous burnt and unburnt bones, rolled pebbles, plates of sandstone, psammites, and schists have been discovered. These plates are abundant in all the caverns inhabited by the reindeer man as well in France as in Belgium. It was also in the neighbourhood of the hearth that the flints were most abundant. A fragment of earth about as large as half the hand has been preserved and it does not contain less than fourteen knives or chips of flint.

Some of these worked flints are in phtanite, principally in *phtanite calcarifere* of the bed V of the Dinant limestone. All the others are of foreign origin, and if it cannot be directly proved that the majority of them came from Champagne, at least this assertion is extremely probable.

There were also procured fifty-four marine tertiary shells, which have been identified by M. Nyst. All these have been derived from Champagne. Their introduction by man into the cavern cannot be doubted. Twenty-five of them are perforated near the mouth, either by friction as especially effected by *Naticæ* and *Pectunculi*, or by means of a pointed instrument. It is then evident that they had relations with Champagne, while every proof of their relation with Hainault or with the province of Liege, which might also have afforded them flint, has been up to the present day lacking.

It is a most important and unexpected fact that it is towards the south that their external relations seem to lead.

I was struck, this summer, with the analogy which the substance of several chips of flint for the cave of Chaleux bore to that of the flints from Pressigny-le-Grand (Indre-et-Loire). This flint has no analogue, it appears, in the cretaceous beds of Western Europe. M. Gabriel de Mortillet has said "the flints which you have shown me are very interesting. They are unquestionably derived from Grand-Pressigny. The

specimen has the reddish yellow aspect of virgin wax, the speckling and slight marbling, the slightly homogeneous aspect which characterises the flints of this locality." The men of the reindeer period carried, then, their relations to the banks of the Loire.

On the 26th May, 1865, the workmen extracted from the objects in the ashes of the hearth the forearm of an elephant. It was in an extremely friable state, which contrasted exceedingly with the state of preservation of all the other bones of the cavern; it reposed on a plate of psammite on the right hand of the hearth (from the side of the opening). My opinion is that these men found it in a fossil state and that they brought it into their cave either as a fetish, or as an object of curiosity.

The quantity of diverse substances which they procured is in fact scarcely credible; and could only be used either as ornaments, objects of curiosity or as fetishes. I have thus discovered a fragment of large ammonite, derived from the psammite of Condroz; two lumps of martial pyrites; much oolitic oligiste like that which is found to the north of the primary basin at the base of the schists of Famenne; nearly half a kilogramme of fluvine derived from the Devonian limestone; nephrite; fragments of the laminæ of elephants' teeth, of which they fabricated their elegant needles; of the slate of Fumay which they cut into various shapes, three fossil shark's teeth, a vertebra equally fossil of the genus *Carcharias*, and the fifty-four eocene shells mentioned above; numerous plates of sandstone, psammites, and micaschist. They especially brought the carved psammites which formed the summits of the anticlinal and synclinal folds of these ancient webs and which have thus a tile shaped form.

They also traced on many plates of psammite lines probably with flint. Worked bones are equally abundant. They are, except the needles, all fabricated of reindeer antlers.

Finally, amongst the 30,000 worked flints discovered in the cavern of Chaleux under this mass of stone, and amongst the 1,200 derived from the beds with reindeer bones in the Furfooz caves, none show any trace of polishing; which from this

point of view, appears to demonstrate the non-contemporaneity of these men with those who made in this country so many polished instruments.

It results clearly from this summary examination, that all these objects of diverse nature were introduced in the cavern of Chaleux by the man who made his habitation therein at an epoch of which the date is exactly determined by the fall of the roof and by the deposit of the yellow clay and of the loess.

To conclude; the following are the succession of events which have taken place in this grotto:—

1. Deposit of stratified red clay, sand, &c.
2. First habitation of this cavern by man. This epoch of habitation can be fixed by means of the little pebble bed, and thus correlated with the precise section of the quaternary strata.
3. Deposit of clay-sand in which a head of *Ursus spelæus* and other bones have been discovered.
4. Fall of a part of the roof at the entry of the cavern.
5. Principal epoch of habitation of the cavern by the man contemporary with the reindeer fauna.
6. Fall of a part of the roof on nearly the whole extent of the cavern.
7. Third inhabitation of the cavern by man. He has left few remains, but he was yet contemporary with the reindeer fauna.
8. Deposit of yellow clay and of loess.

The level of this cavern is situated only 17 metres above the level of the river. (See Table, next page.)

The four caverns of the escarpment of Furfooz, situated at a maximum height of 40 metres above the level of the Lesse, only contain the horizon of yellow clay with angular fragments which commonly becomes grey and sandy in its upper part. Two of the caverns have not furnished human remains, viz., the *Trou qui igne* and the *Trou St. Barthelemy*.

The *Trou Rosette*, on the other hand, has furnished many human remains and animal bones in the middle of the deposit of yellow clay and fragments of limestone. It had at the base some rolled pebbles which may be considered to be from the Ardennes.

According to M. Dupont, the following table comprises the

series of sedimentary strata which have been recognised in fourteen of the caverns.

	Loess and Yellow Clay with angular fragments of limestone	Stalagmite	Sandy clay deposit, with vein of pebbles	Rolled pebbles from the Ardennes	Sand, with turbary	Red clay, with glittering particles
Grand trou de Chaleux	*	*	*			*
2e Caverne of Chaleux	*					
3e Caverne of Chaleux	*		*			*
Trou de Frontal	*		*	*	*	*
Trou de Nutons	*	*	*			*
Trou de la Gatte d'or	*	*	*			*
Trou Rosette	*			* ?		
Trou qui Igne	*					
Trou Renviau	*					
Trou St. Barthelemy	*					
Caverne de Montfort	*					
Trou Magrite	*	?		?		
1e Caverne de Pont-à-Lesse ...	*					
2e Caverne de Pont-à-Lesse ...	*					
1e Caverne des fonds de Leffe ...	*					
2e Caverne des fonds de Leffe ...	*					
Trou des Blaireaux	*		*			
Trou de la roche-à-Penne ...	*		*			
Trou de l'Ours	*		*			
Trou de la Naulette	*		*			
Trou de l'Hyène	*	*	*			
Trou de Praule	*		*			
Trou des Allemands	*			*		
Trou de Gendron	*					

The *Trou Renviau* contains the same yellow clay and the reindeer fauna.

The *Trou de la Gatte d'or*, of which the height above the Lesse is only 30 metres, contains the same groups of beds as *the Trou des Nutons*.

The *Trou Magrite* at Pont à Lesse is a large cavern analogous to the largest one of Chaleux. The earth was extracted therefrom thirty years ago; but the rocky soil has not yet been reached. The earth removed thence is composed solely of yellow clay with angular fragments of limestone which were probably surmounted by loess. M. Dupont has as yet been able to collect more than fifty worked flints, an eocene shell, some broken marrow-bones, a molar of horse, &c. At the time of my visit (July, 1866) a further exploration of this cavern was contemplated by M. Dupont, which doubtless will yield new and interesting materials. (See *Journal* A.S.L., vol. ii, p. lx.)

The cavern at Montfort, at Dinant, furnishes the remains of rhinoceros, Ursus spelæus, &c., with those of reindeer and of other species. These bones were collected at the base of the deposit of yellow clay with angular fragments of limestone measuring in all 4 metres of thickness. In some parts of the cavern the limestone was covered with pebbles, of which the greater number were of the size of a pea; they were cemented together, like the pebble bed of the stratified sandy clay deposit of the caverns of Chaleux and Furfooz, by a brownish clay, and M. Dupont is inclined to refer them to this deposit.

The two caverns of *Fonds de Leffe*, near Dinant, only contain the deposit of yellow clay with its angular contents, which has often become greyish yellow in the upper part. It does not contain bones nor remains of human industry.

To summarise the chief palæontological products of these various beds:—

M. Dupont has only observed the *red clay* on the Lesse; but as it is there alone that he has made important excavations, no general law can be deduced from its distribution. It only exists at Furfooz in the caverns which are situated at less than 35 metres above the level of the Lesse, but it rises to 40 metres at Chaleux. In all cases it is possible to discover its origin. The first cavern where it was observed was the Trou des Nutons. Its great purity and its red brick colour led M. Dupont to suspect that it was the product of a special description of those *filons d'argile* which have been studied by M. d'Omalius d'Halloy since 1833. This view was entirely con-

firmed by the excavations of the Trou de Frontal, where these clays are in *filons*, and the question takes here a new aspect, as it is evident that they are anterior to the deposit of sand and turbary, and to the deposit of rolled Ardennais pebbles. M. Dupont has observed, near the village of Celles, situated at three kilometres to the east of these caverns, *filons meubles* formed of this same lustrous pure clay; these filons exist principally at Noisy in the foundations, and near the mouth of the rivulet of Cellis, in the Lesse, in the middle of the limestone.

The level of the rolled pebbles is only marked in an incontestable manner in the Trou de Frontal. Some indices lead me to believe that there exist traces in the Trou Rosette.

The sandy clay deposit with calcareous nodules has a more constant distribution and in the Trou de Chaleux it was partially posterior to the habitation of the country by man. This deposit contains the *Ursus spelæus*. It is besides characterised by a deposit of pebbles of which I have found the analogue in the external quaternary strata. It was after this deposit that the fauna of the reindeer was spread over western Europe as far as the Pyrenees, and that man developed himself over the country. The waters which had deposited the sandy clays with calcareous nodules had retired into their bed, which nearly, if not quite, coincided with the present bed of the river.

Man probably inhabited the Trou de Chaleux for a long time, to judge by the enormous number of *débris* which he left there, and he was probably driven thence by the fall of a large part of the roof. The great mass of stones which thus covered the soil abandoned by man, removes these numerous and interesting *débris* from all suspicion of being disordered by any cause, until the time when the excavations of M. Dupont exposed them.

The man of the reindeer period inhabited a short time the Trou des Nutons at Furfooz, if we can deduce this from the small relative number of objects which he left behind him. This opinion was put forward by the late Henry Christy, and by M. Lagannc, who for many years has excavated the numerous caverns of the south of France. M. Dupont has deduced the short time during which man has inhabited this cavern

from the coating of stalagmite which covers the sandy clay deposit of the cave; it is in fact evident, that if man had inhabited this cave before the formation of the coat of stalagmite, this calcareous deposit would have contained traces of some kind of this habitation; it is, on the contrary, of a remarkable purity and homogeneity, and contains neither earth, nor bones, nor remains of human industry.

The *Trou de Frontal* has served as sepulchre to these men who buried thirteen bodies in this natural dolmen, of which the entry was closed by a large dolomitic partition (*dalle*). Man has left remains of his meals and of his industry in the external chamber of the cavern, and the observation, with regard to the number of these remains which we have made with regard to the Trou des Nutons, is equally applicable to this cavern.

The *Trou Rosette* also contained remains of many human skeletons, but it affords a less easy explanation. Examination of the other phenomena which have been observed in the province, and especially of the phenomena found in the open country, may at a future time, in the hands of Dr. Dupont, throw light upon the conditions under which human existence in this cave has been possible.

The deposit of yellow clay with fragments of rocks, has taken place solely after the man of the reindeer period inhabited the caverns of the country. Everyone must be struck, in throwing his eyes over the table of the general repartition of the beds of these fourteen caverns, with the constancy of the geological horizon which is everywhere encountered with the same characters; yellow clay at the base, greyish yellow sandy elements at the upper part, and numerous angular fragments in all the mass, and principally at its base.

After these deposits, man only inhabited these caverns accidentally. Nothing is found above these sediments, but several, more or less modern, objects, which prove by their small number a habitation of very short duration, if ever there was an habitation. The cavern which has shown most of these remains is the Trou des Nutons; it has furnished remains of all ages: two splinters of polished stone and a little point of a flint arrowhead; a fragment of ring in pottery which appears

to be pre-Roman; a certain quantity of pottery, many medals and some Roman ironwork (we have seen that a Roman fortress existed on the summit of this escarpment), and several Frankish remains of middle age, and of modern times.

At Chaleux the objects found at the surface are much more modern; none of these date even from mediæval times. This proves that the really troglodytic race of this country was the man of the reindeer period, who had not the art of polishing flint, as is shown by all the splinter, which amount to more than 32,000, collected up to the present time in the caverns of the Lesse valley.

The most important generalisation to which the learned author arrives is that in which he attempts to correlate the quaternary series of the valleys of the Seine and of the Somme

	Valleys of the Meuse and of the Lesse.	Valleys of the Seine and of the Somme.	
Upper stage. *Cervus tarandus.*	Loess, or brick earth, existing in the plateaux and in the valleys.	Loess, or brick earth.	Diluvium rouge.
	Yellow clay, with *blocaux* of ancient rocks covering the plateaux and the valleys. Reindeer fauna in the caverns.	Sandy red clay, with broken and angular flints, covering the plateaux and the valleys, and ravining and lower beds. Diluvium rouge, *propre-ment dit.*	
Lower stage. *Elephas primigenius.*	Stratified sandy clay deposit, with shells, principally terrestrial, and with calcareous concretions. *Ursus spelæus, Elephas primigenius,* etc., in the caverns. Lehm.	Sandy and marly clay, with shells, principally terrestrial, and with calcareous concretions.	Diluvium gris.
	Quartzose sand, with shells, principally fluviatile (accidental).	Quartzose sand, with shells, principally fluviatile (accidental).	
	Rolled boulders of Ardennais rocks, etc., and large unrolled blocks coming from afar. Tusk of *Elephas primigenius.*	Rolled flints, etc., and large unrolled blocks coming from afar. Bones of *Elephas primigenius.*	
	Quartzose sand (very accidental).	Quartzose sand (very accidental).	
	Primary rocks.	Secondary and tertiary beds.	

with those of the Meuse and of the Lesse. On comparing, *e.g.*, such beds as those of Agimont and other localities with the sections presented by the quarries of Abbeville and Amiens, the following succession can be traced out. Like conditions occur in each.

The occurrence, in the various caves, of beds of stalagmite above various layers of the beds here shown, complicates the stratigraphy slightly; at the same time that it measures roughly the time which may be supposed to have elapsed between and the position of each of these layers.

For valuable assistance and hospitality during my stay at Dinant, it is impossible for me to thank too cordially Dr. Edouard Dupont, Corr. Mem. A.S.L. Those persons alone who have themselves visited all the caves, can appreciate the amount of physical labour which it is necessary to undergo, and which Dr. Dupont has endured throughout the hard frosts of the winter of 1865, and the great heats of the summer of 1866. Having personally on the spot verified all M. Dupont's sections, I can testify to their perfect accuracy; I can also testify to the care with which his facts have been accumulated, the skill with which the correlation of the various beds has been worked out, and the generosity with which the results he has obtained have been placed at my disposal. The disinterested frankness with which he communicated to me all his facts renders Dr. Dupont an example of scientific ethics not merely to Englishmen, but to the whole world.

Our late energetic local secretary in Brussels, Mr. John Jones, F.G.S., was the first to place at our disposal the knowledge of the principal facts which were discovered. Had it not been for him, the Anthropological Society of London would never have sent a commissioner to examine into the subject. To his influence amongst Belgian scientific men much of the success which I hope has attended my mission is due.

M. Charles Dumon, Ingénieur-en-chef des Ponts-et-Chaussées for the province of Namur, has verified the sections throughout. His kind influence has led in part to the results now on the table.

My own experience having taught me the difficulty of obtain-

ing reliable anatomical information in England, I proceeded to Paris, and had the opportunity of comparing the jaw with collections in the Paris Museum of Natural History, in the Museum of the Société d'Anthropologie, and with some most important specimens in M. Pruner-Bey's private collection. To M. Pruner-Bey himself, as well as MM. Broca, Lartet, and Quatrefages, I am very grateful for valuable and important advice.

The whole subject is as yet entirely in its infancy, and I trust that further examination will be undertaken.*

* For description of jaw found in cave of La Naulette, see *Anthropological Review*, vol. v, p. 294.

XXII.—*On Ancient Peruvian Graphic Records.* By WILLIAM BOLLAERT, F.R.G.S., Hon. Sec. A.S.L., Corr. Mem. Univ. Chile, of the Ethnological Societies of London and New York, etc.

IN my work on South American Antiquities,* I advert to the graphic records and Quippus of the Peruvians, and to the statements of early writers, that the ancient Peruvians used a species of hieroglyph engraved on stone, and preserved in their temples. However, not one example has been preserved to show whether such was hieroglyphic or merely figurative.

On reference to a paper of mine in vol. i, *Memoirs* of the Anthropological Society, 1865, "Introduction to the Palæography of America," I brought together all that was then within my reach. Subsequently was discovered the hieroglyphic Maya alphabet of Yucatan, preserved by Landa, which led me to compare the hieroglyphs and codices of Central America in particular by this long-hidden treasure. The daguerreotype of a Llama skin, painted with characters, lately found in Bolivia, has again prompted me to look into the question. I will first allude to the very little that is known on this subject as regards—

Ecuador. The first people there is any account of had their capital at Quito, and were governed by chiefs called Quitus; these were conquered about A.D. 980, by a coast nation, known as the Caranes. No graphic records have been handed down of either Quitus or Caranes. At p. 92 of my *South American Antiquities*, I have given a plate of an ancient embossed earlet from Cuenca, with something like a symbol on it; this is the only approach to graphic design I have met with from Ecuador.

Humboldt, *Researches*, i, 177, tells us that, in large spaces between the rivers Atabapo and Cassiquiare, and destitute of human beings, figures engraven on stone show that these wildernesses were once the seat of some degree of intellectuality.

* *Antiq. Ethno., etc., Researches in Peru, etc.* Trübner, 1860.

Between 2° and 4° N. are found rocks of granite covered with colossal figures of alligators, jaguars, the sun, moon, and domestic utensils. He was inclined to view these remains as traces of an ancient civilisation belonging, perhaps, to an epoch when the tribes, whom we now distinguish by various appellations, were still unknown. In his *Travels*, ii, 395, he observes, the Amazon stones of green jade, found in possession of the Indians of the Rio Negro, worn suspended from the neck like amulets, are loaded with inscriptions, not the work of the present owners. In his *Researches*, i, 153, he heard of inscriptions on granite mountains, extending from Uruana, 7° 5′ N., 67° 22′ W., as far as the banks of the Caura. A missionary, Ramon Bueno, having entered a cavern in this district, saw a block of granite on which were what he believed to be written characters. The missionary gave Humboldt a copy of part of these, which had some resemblance to the Phœnician alphabet; but he doubted whether the monk had copied them carefully. Humboldt says, from such meagre facts, it results that there exists no certain proof of the knowledge of an alphabet among the Americans. This was written by the great traveller and philosopher in Paris, in 1813; but in 1863, the Abbé B. de Bourbourg accidentally lighted, in Madrid, upon Bishop Landa's MS., in which is depicted the alphabet of the ancient Mayas of Yucatan.

Humboldt, *Researches*, i, 174, observes: "We are ignorant whether the tribes of the Toltec race penetrated into the southern hemisphere; but a curious fact, with which I became acquainted during my abode in Lima, leads to this supposition. Narcisso Gilbar, a Franciscan, found among the Panoes, on the banks of the Ucayali, in Peru, north of Sarayacu (6° 57′ S., 57° 40′ W.) bundles of paintings resembling a quarto volume. Gilbar was told that these paintings contained hidden things, which no stranger ought to know. He sent one of these collections to Lima. Every page was covered with figures of men, animals, and isolated characters, which were deemed hieroglyphical, arranged in lines with order and symmetry. It was intended to deposit this MS. in the convent of Ocopa; but whether the person to whom it was intrusted lost it in the pas-

sage over the Cordillera, or whether it was sent clandestinely to Europe, it never reached its first place of destination. Every search to regain so curious an object was fruitless, and the regret of not having copied the characters came too late. The Panoes say that these books were transmitted to them by their fathers, and supposed to have relation to wanderings and ancient wars."

Tschudi, *Travels in Peru*, p. 411, speaking of the tribes of the lower Ucayali (among which are the Panoes), observes, that on the birth of a child, the name of some animal is given to it; the witnesses of the ceremony mark, with a wooden pencil, some hieroglyphical characters on two leaves, and on the death of the Indian, the leaves are deposited in the grave with the body.

PERU.

I now notice all we at present know of graphic records in Peru. I put but little faith in the statements of Montesinos, who writes that, five hundred years after the Deluge, the Peruvian rulers commenced reigning; that during the reign of the third, in his list of one hundred and one! the use of letters was known, and the art of writing on plantain-leaves taught; that in the reign of his sixty-fifth ruler, Titu, there were civil wars, and the use of letters lost; that Titu looked upon letters as the source of public troubles; and when a learned Indian, some years afterwards, invented a new sort of character, the Inca put him to death; that the seventy-eighth ruler introduced the quippus of knotted, coloured strings, by which they kept accounts and historical records.

Acosta, a more reliable authority, says, the Peruvians had symbolical paintings; for at the conquest they made their confessions by paintings and characters. We are not informed if this sort of painting had been taught to the Indians by the Spanish priests, as was resorted to in Mexico; or whether it was an aboriginal art. I do not know of the existence of one example of such symbolic mode of painting in Peru; still it is probable they had some approach to figurative representation.

As a pre-incarial example of graphic art, Tschudi states that, in many parts of Peru, chiefly in situations greatly elevated

above the level of the sea, are vestiges of inscriptions; and he gives a drawing of a stone found at Huari, containing outlines of a man, llama, and other markings. At Corralones, near Arequipa, are sculptures on granite stones of animals, flowers, and fortifications, which may be of Incarial times.*

At p. 203 of my *S. Amer. Antiq.*, I give a drawing of a Chimu (Trujillo) deity; there are compartments on the body containing an approach to symbolic forms; also two others,—one like a mountain; the other of a large flying insect. This I have placed in the British Museum. In the same collection is a specimen of *huaca*, or sacred tomb pottery, probably a priestess; on the forehead are some angular figures.

At p. 218 of my *S. Amer. Antiq.*, I describe, from Rivero and Tschudi (plate xxvi), a sacred vessel, probably from Pachacamac, the shape of a human figure, perhaps a priest, having round the waist a mystical looking belt. I make nothing out of this arrangement. The following may be considered as Inca or Quichua work. Figure of a llama, carved out of stone, which Gibbon, *Explorations in Peru*, calls a drinking-cup; the scratchings upon it may have a meaning. Gilliss, *U. S. Astron. Exp.*, ii, 138, gives drawing of an approach to symbols, on a chuspa, or coca bag. On the *huaca*, or sacred pottery from the tombs, are indications of natural objects, in relief and painted, of the sun, moon, stars, plants, fruit, human figures, animals, weapons, etc., but no hieroglyphic signs.

At p. 146 of my *S. Amer. Antiq.*, is a plate representing

* Whilst this paper was at the Nottingham Meeting of the British Association, 1866, I received from my friend Professor Raimondi, his communication in Spanish, which I translated and sent, "On Ancient Engravings on Stones observed in various parts of Peru." No. 1 to 9 were from the Altos de Caldera, north of Arequipa. No. 10 to 16 from Locumba. The stones are diorite (feldspar and hornblend), and at Caldera, known as the Campanas del Diablo, being very sonorous. The hornblend is a compound of silicate of lime, magnesia, and protoxide of iron; this last, by exposure, becomes a peroxide, and it is through a film of this peroxide the engravings are made, generally with a sharp pointed stone down upon the lighter coloured diorite. Some of these engravings are much more ancient than others. They are all of the first state, or merely figurative, as men, animals, birds, serpents, etc. Professor Raimondi's paper may appear in vol. iii of the *Memoirs* of the Anthropological Society.

what I have called the Peruvian Calendar, or Zodiac; it is of gold, and the figures are stamped thereon; some are figurative, others appear to be symbolical.

At p. 157 of same work is a plate of the Pintados, or Indian pictography, observed by me in the province of Tarapacá. The figures consist of colossal representations of Indians, llamas, dogs, circles, etc., scooped out on the sandy sides of mountains; at one spot, a body was found. At Tacna in the neighbouring province, Pintados are also seen. At Pisco, farther north, on the peninsula of Parracas, there is a pintado of considerable size, in the form of a trident; at the base is a square, underneath it may contain a *huaca*, or tomb.

In 1854 I made a journey into the Andes of Tarapacá, and a little to the south-west of the rich copper mines of Yabricoya is the Pampa del Leon, 20° 10′ S., 69° 10′ W., so named from a large boulder, having picked out upon it, with other objects, an Indian wrestling with a puma, having a very ancient appearance; there is a Christian cross placed there by some Spanish priest with the hope of exorcising the original paganism.

At the end of *Molina*, vol. i, *His. Chile*, is an account of a pillar 150 feet in height! in the province of Cuyo, known as the giant, said to have inscriptions "resembling Chinese characters!" There is also notice of another engraved stone near the Rio Diamante, south of Mendoza, containing "cyphers or characters and the impression of a man's feet with figures of animals;" the Spanairds call it the rock of St. Thomas, from a belief that the saint wandered in these regions!

When in Paris in 1866, my friend the Abbé B. de Bourbourg showed me a copy he lately made in Madrid of a Quichua MS. entitled *Relacion de Antiguedades deste Reyno del Peru*, by Don Juan Santa Cruz Pachacuti Yumquiz Salcamaygua, containing a drawing of the back gable of the *Coricancha*, or Temple of the Sun, at Cuzco. The whole of the said gable is seen to be covered with well drawn figures in outline. 1. Five stars and oval outside the gable. 2. Five stars. 3. Large oval said to represent the Creator in heaven and earth—the Great Unknown, and had a glory round it. 4. The sun. 5. The moon. 6. Star

of night. 7. Venus. 7a. Clouds or winter. 7b. Stars or summer. 8. Southern cross. 9. Probably indication of the maize harvest. 10. Man. 11. Woman. 12. The rainbow. 13. The world or earth. 14. The River Pilcomayo issuing out of the earth. 15. Lightning. 16. Unseen eyes that see everything. 17. The sea. 18. A spring of water. 20. Hailstones. 21. A tree. 22. Collca-pata, a building carved with plates of gold, and called the Corichanda or Temple of the Sun.

I conclude these observations with an account of the *recently discovered Peruvian figurative writings.*

In vol. i, p. 187, *Memoirs* Anthropological Society, I allude to the daguerreotype of a llama skin in the museum at La Paz in Bolivia, some thirty-four inches by twenty-five covered with lines of characters. Tschudi, to whom was shown the daguerreotype by Mr. Helsby, of Valparaiso, was led to think that the characters were probably indications of some Christian form of worship. In December, 1865, my friend Mr. G. W. Helsby, of Liverpool, entrusted to my care for examination the original daguerreotype taken by his brother and Mr Tiernan in 1857. Mr. Tiernan tells me it was the opinion of a priest at La Paz, that the figures were of ancient invention.

It was found in the Peninsula of Copacacava in the Lake of Titicaca, which is in the old Aymara country. The height of the daguerreotype is three and one-eighth inches, in width four and two-eighths, the figures generally one-eighth to one-sixth of an inch. The skin is much shriveled, distorting the figures, apparently drawn with a black composition. The skin is stretched between two Indian weapons, one a stone axe, the other a sort of halberd.

The writing is in ten lines, and I describe it from top to bottom, and from left to right:—

1st line. The first representation looks like a gallows, and an Indian hanging from it, a Spaniard at the spot may be the hangman. The circle with points may mean the sun or day. An Indian is seen falling as if wounded. Another is being flogged before a Christian cross.

2nd. Commences with seven upright strokes, may mean *there* are seven Indians to be flogged. An Indian kneeling, *being flogged* before a group of Spaniards.

3rd line. A Spaniard firing an arquebuse at an Indian. Dots and strokes, doubtless to act as numbers. Figure in a menacing attitude. Parties fighting. A monk or priest.

4th line. Man with thick stick. Apparently a Christian oratory. A man with a weapon, another with an arquebuse. Man firing an arquebuse. Two Indians kneeling. Spaniard blustering. People in conflict.

5th line. Man attacking as if with a lazo. Strokes. Spaniards with arms akimbo. Kneeling figure. Figure before a cross. A priest. Spaniard trailing a pike. Two Indians kneeling before a cross. Indian prisoners. Spaniards. Figure before a cross.

6th line. Indian kneeling. A priest and cross. Two figures kneeling before a Spaniard. A Spaniard holding up an Indian child by the leg, the mother supplicating for it. Cloaked and armed men. Two more examples of men holding up infants, and mothers supplicating. Series of strokes. Spaniards. Indian kneeling before a cross.

7th line. Man attacking. Man with uplifted arms. A cross. Ten strokes joined, and three series of strokes not joined. Man with a whip.

8th line. Children. Indians. A tree. Spaniard as if shooting. Another approaching with an arquebuse. Kneeling figure apparently a priest, may be giving absolution before execution. Man running away. A priest. Indian. A cross.

9th line. Strokes. Figure on the ground. Figure holding his arms towards the latter. Series of strokes and circles. Two figures meeting. Figure with outstretched arms. Strokes. Circles. Armed figure. A cross.

10th line. A priest. Kneeling figures. Woman kneeling before a cross. Two women seated. A tree. Kneeling figure before a cross. Same as last. Spaniard arms akimbo. Figure before a cross. Same as last. Series of fifteen strokes.

It has been already stated that Tschudi thought this figurative composition was indicative of some form of Christian worship. I, however, after careful examination of this specimen of picture writing, interspersed with numerical representations, suppose that something of this style was even known to the

Aymará and Quichua Indians before the conquest, and that they thus in this case represented the sanguinary doings of their conquerors. These paintings the Indians did in secret and were handed down to their children, so that when any opportunity offered to be revenged on the Spaniards, their sufferings should not be forgotten and vengeance taken, of which there are fearful instances, including that of Pumacagua in 1780, that of Condorcanqui some years later.

This painted skin, having been found at Copacavana, leads to the idea that it is of Aymará origin; for as yet nothing of this character has been met with among the Quichua-Inca Indians, and may be called a figurative and numerative document.

This is all we at present know of graphic art in Peru and neighbouring lands; it is worth while recording for the reason there is so little of it.

XXIII.—*On the Physical Characteristics of the Inhabitants of Bretagne.* By John Beddoe, M.D., V.-Pres. A.S.L., Foreign Associate of the Anthropological Society of Paris.

The materials for this paper have been obtained in part from those afforded by the several memoirs and papers of Broca and Boudin, on the stature and other physical characters of the people of the French empire. My friend, M. Broca, has moreover favoured me with further information on the subject during my intercourse with him. Much has been derived from the two valuable tracts of Dr. Guibert of St. Brieuc, which refer almost exclusively, however, to the department of the Côtes du Nord. For me they have, however, a peculiar value, as Dr. Guibert has done me the honour to apply my own methods of observation to the inhabitants of that department; wherefore, his facts may be compared or contrasted with my own, with almost as much confidence as if they had all been obtained by a single investigator. Lastly, I am able to refer to the results of a very hurried excursion, which I was able to make in Bretagne in the course of last autumn (1869), when I visited the stones of Carnac and Lokmariaker, and the towns of St. Malo, Dinan, Rennes, Auray, Kemperlé, Kemper, and Morlaix. Of these towns, the last-named four are within the limits of the Breyzonnec language: it is true that they are all situated on the railway which girdles the country; but the formation of that railway is but recent, and the native population has as yet been but little disturbed. Indeed, there are probably few portions of western Europe, of equal extent, in which the native population has been less adulterated during the last few centuries. This is owing partly to the peninsular situation of Bretagne, but still more to the deep and obstinate attachment of the Bretons to their language and nationality. I have it on the best possible authority, that of Count de la Villemarqué, that the boundary line of the French and Breton languages is to-day precisely where it did in the fifteenth

century, which is the more remarkable inasmuch as it does not coincide with any strongly-marked geographical barrier. A French colony may be said to have been planted at Brest, and another at L'Orient; and the language of law, and civilisation, and the school, has gradually gained, in the other towns, on that of the market and the nursery; but in the rural districts, within the boundary, there has been hardly any admixture, whether of blood or of language. Exclusive as are the Welsh, and defended from amalgamation, moreover, by stronger physical obstacles, they are probably, on the whole, a less pure blooded people than the Lower Bretons.

The French speakers—who lie east of the boundary, occupying the departments of Ille-et-Vilaine and Loire Inférieure, with about half that of Côtes-du-Nord, and perhaps a third of that of the Morbihan—are called by the genuine Bretons *Gallo*. The name may be of some importance with reference to the question, when and how the Romanisation or Frenchification (call it which you will) of this extensive district took place. It is possible, indeed, that the word Gallo (whence Gallec, applied to the French dialect of Upper Bretagne) may mean simply a stranger or foreigner, as Gall does in Erse; but if this conjecture be rejected, we must suppose it to date from a period when central France was still Gallic, while the Armoricans distinguished themselves as non-Gallic. On this latter supposition, the fact that the Carlovingian, and perhaps even the Merovingian Franks, were called Gall by the Bretons, need cause us no doubt nor difficulty, if we recollect that the word Saxon, or some variation of it, was applied, by our British Celts, equally to the Saxons themselves and to their Norman conquerors. The most simple view that can be taken of this Gallo population is, that it resembles that of eastern Monmouthshire, which really consists of Welshmen who have lost their language and been slightly crossed in blood, but which is regarded as Saxon by the Welsh, and as Welsh by the west-country English.

The ethnological changes known, or supposed to have occurred in Bretagne since the beginning of history, are as follows:—

1st. The Romans completely subdued the country, and massacred, or sold for slaves, the most important tribe, that of the Veneti in Morbihan. But it is not likely that they introduced much new blood.

2nd. In the fifth century, large immigrations took place, it is believed, from the western portions of insular Britain. The colonists occupied especially the northern coast.

3rd. Saxon, Frisian, and Scandinavian pirates harassed the coasts for centuries, and seem to have formed permanent settlements on some of the islands, and about the mouths of the Loire and other rivers.

4th. The Franks made repeated attempts, with varying success, to conquer the eastern portion of Bretagne, but any new element introduced by these attempts would probably be rather Romanised Gallic than Teutonic.

5th. The Normans of Normandy, especially in the eleventh century, exercised great political influence in Bretagne, and had at least a military occupation of some north-eastern districts.

The general result of all these partial changes in the population should, one would suppose, be exhibited in an approximation, so far as regards the Gallo population, to the physical characteristics of these nearest neighbours. The people of the northern coast should show some approach to the prevailing types of the West of England; but the original type should still preponderate almost everywhere, and be especially pure in the centre and south-west. Facts seem to me to bear out these inferences to a great extent.

The Breton is, as a rule, a man of short stature, compact and strongly built. His head is broad, the ears wide apart, and the zygomata expanded, the cheekbones also often prominent. There are two prevailing types of feature, one of which corresponds to some extent with the Kimric of Edwards and of French anthropologists generally: in this the face is long, the nose long, aquiline or sinuous, and the chin narrow. But much more frequently the face is broad, short, and squarish, and the general aspect reminds me strongly of the mountaineers of the Apennines. Dr. Guibert speaks of a certain prominence of the face, *i.e.*, as I take it, of the central portion of the face, as be-

longing to this type, which he calls Turanian or Iberian, and others Ligurian, and which is common enough in most parts of Wales.

The eyes are of various colours; often brown no doubt, but very often dark grey, or sea-grey, what De Belloguet calls "bleu de mer foncé"; they are seldom, I think, obliquely set, but have often that almond shape and heavy eyelid with which obliquity usually concurs. The hair is generally coarse and often somewhat curled: in about three-fourths of the people it is very dark, and in about one-fourth, according to my observation, it is coalblack. Dr. Guibert and Dr. Guiche make the proportion of black hair in the Côtes du Nord upwards of 40 per cent. Red hair is not particularly uncommon.

My observations on the colour of the hair were a great deal restricted by the prevailing fashions in Bretagne. The men, indeed, allow their hair to grow long, and to hang in shaggy locks; but the women cut theirs short, and hide it under a close cap; and this statement applies especially to the peasant women, whom it was most desirable to examine, but who for the most part completely baffled my investigations.

The Bretons are, as said, of low stature: they are remarkable in this respect even among the French. Our data are derived entirely from conscription statistics, and as these refer to young men of twenty years, they do not indicate the full adult stature of the race. In a good many cantons the average number rejected for insufficient height, (*i.e.*, for falling below 156 centimetres=5 ft. 1 in.), equals or approaches 40 per cent.* We may probably estimate the full adult male stature in these cantons as averaging 5 feet 3 inches. They form part of a district represented on the anthropological maps of Broca and Guibert as stretching from sea to sea along the confines of the Finistère and of the two neighbouring departments, and corresponding pretty well, except in its approach to the sea at its northern extremity, to that in which the Armorican race may be supposed to have remained most free from admixture.

* Guibert, who takes for his basis of calculation the numbers actually measured. Broca takes a different basis.

Some of these cantons, but not all of them, are hilly, barren, and poverty stricken, and those that attribute great power to "media" or external causes, may be disposed to credit poverty and scantiness of food with producing the stunted stature of the people, but Dr. Guibert points out that in some cantons near the northern coast, where the soil is rich and the people are well-to-do, the stature is but little more elevated. But in proceeding eastward along the same coast, though the soil is less fertile, and the population not richer than in the neighbourhood of Lannion, the change from the Breton to the Gallo, *i.e.*, from comparatively pure to mixed blood, is accompanied by a considerable augmentation of stature. And the same is the case wherever else we have reason to suppose the existence of much mixture of blood. Thus the stature rises in the Leonais, the district which community of traditions, as well as other reasons, point out as that most freely colonised from Great Britain; it rises in the Ille-et-Vilaine, towards the border of Normandy, and still more in the populous, commercial, and long-Frenchified department of the Loire Inférieure.

So much for the stature of the Bretons. As for the form of the head, Broca long ago set it down as short and broad, except in the Leonais district already mentioned. And Drs. Guibert and Guiche have put the fact beyond doubt, so far at least as concerns the department of Côtes du Nord. These observers have measured no less than 866 living heads, and find the average modulus of breadth in the Gallo and in the most purely Breton districts, which here coincide, to be about 84·5, while in the Breton coast lands, towards Lannion, where British immigration is suspected, it falls to 81·4. Four men from Finistère yielded me an average modulus of 82. Once more, as to the colour of the hair and eyes. Dr. Guibert's observations were made on 777 conscripts of the Côtes du Nord, and he has digested them into a table arranged on my own system. His results are curious. He finds light eyes and light hair more common in the coast districts of Lannion and Treguier, already signalised for the comparative dolichokephaly of the people, than in any other part of the department. Light hair is also slightly more

common in the Gallo cantons than in the purely Breton interior, but light eyes, contrary to what might perhaps have been expected, seem to be less numerous in St. Brieuc and Dinan, cantons near the coast of the Gallo region, than in any of the other divisions.

I myself tabulated 900 observations on the eyes and hair, of which 400 were taken in and about St. Malo, Dinan and Rennes, all in the Gallo region, 133 in Morlaix, which may be taken as representing the Leonais, and 368 in and about Kemper, Kemperlé, Auray and Carnac, in the purely Armorican district. I found the proportion of dark hair, estimated by what I have called the Index of Nigrescence, *e.i.*, by subtracting the red and the fair from the dark brown plus twice the black ([2N + D]—[R + F] = index) to vary inversely as the probable amount of blood mixture. Thus at Kemperlé it was 111, at Kemper 92, at Auray and Carnac 87, at Morlaix 78, at Rennes about 70* or 75, at St. Malo and Dinard 67, and at Dinan† 53.

The figures towards the close of the series do not differ much from those I have obtained in Wales and Cornwall, but those at the head are far more striking in the direction of darkness than any that could be found in Wales or Ireland, nor could those gotten at Kemperlé be paralleled anywhere on this side of Rome or Naples, so far as my opportunities enable me to speak.

Yet the likeness between the Bretons and the Welsh is as undeniable as that between their respective languages. And if I may trust my own eyes, and those of an unbiassed observer who accompanied me, the Morlaix folk resemble their supposed kindred in the west of England, in their general turn of features, as well as in their comparative fairness and length and narrowness of skull.

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* I unfortunately lost my Rennes observations after having tabulated them; and here quote them from memory.

† Where an English colony, established some fifty years, may have produced some effect.

COLOUR OF HAIR AND EYES IN EIGHT HUNDRED AND ONE BRETONS.—PERCENTAGES.

	Number of Persons observed	EYES LIGHT.					EYES NEUTRAL.					EYES DARK.					Index of Nigrescence.
		HAIR.					HAIR.					HAIR.					
		Red.	Fair.	Brown.	Dark.	Black.	Red.	Fair.	Brown.	Dark.	Black.	Red.	Fair.	Brown.	Dark.	Black.	
Kemperlé.....	50	1·	1·	13·	13·	2·			6·	12·	18·	1·		2·	13·	18·	111
Kemper	190	2·3	2·3	12·9	15·8	3·4	1·		3·4	8·1	3·7	·8		5·2	20·5	20·2	92
Auray, Carnac, and Lokmariaker ...	128	1·2	7·8	13·3	11·7	1·2			3·5	10·1	7·4			3·9	23·8	16·7	87
Morlaix	133	2·2	3·4	15·3	19·5	2·2		·8	3·4	10·1	3·	·8		4·5	22·9	11·3	78
St. Malo, Dinard, etc.	150	3·	7·7	16·	18·3	2·3		·7	3·6	9·3	1·6		·7	5.	20·	11·7	67
Dinan	150	2·	7·7	18·	22·	1·7		1·7	4·3	8·7	2·7		1·3	3·3	13·7	6·3	53
Cornwall(Redruth)	400	2·4	5·9	19·5	21·8	2·2	1·1	·6	3·	8·4	2·1	·5	·6	5·1	16·5	10·2	64
Normandy, (Caen, Bayeux & Dieppe)	654	1·5	10·2	28·9	11·2	·3		1·4	7·3	7·	·5	·4	·6	6·1	22·	2·6	33

The Cornish and Normans have been added for the sake of comparison and contrast. At Kemper, and still more at Kemperlé, males greatly predominated; at Dinan, females: elsewhere, the numbers of the sexes were equal, or not far from equal.

XXIV.—*Account of the Skull of a Ghiliak. Appendix to Article II, pp.* 21-40, "*On the Skeleton and Skulls of Aïnos.*" By J. Barnard Davis, M.D., F.R.S.

Since the memoir, which appears in the early part of this volume (pp. 21-40), was written, by the rare generosity of a friend, Dr. Isidore Kopernicki, himself a craniologist of eminence, I have had presented to me a skull belonging to a different race of aboriginal people, inhabiting the same remote part of the globe. This is the calvarium of a Ghiliak, a people who dwell on the Sea of Okhotsk, the Strait of Tartary, and in the Island of Saghalien. For many reasons it is desirable that some account of this Ghiliak skull should be placed in connection with that of its near neighbours in the island, the Aïnos.

The history of the finding of the Ghiliak calvarium is curious: a Polish patriot, exiled to Siberia in 1835, Mr. H. Weber, was engaged in making a botanical excursion, in 1858, in the Trans-Amurian province; and traversing a forest in the neighbourhood of Lake Kizia, discovered it in the branches of one of the trees. I am not certain whereabouts this lake is situated; the whole of the Amurian region abounds in lakes; still it is believed to be on the eastern side of the range of mountains which runs parallel with the Strait of Tartary, not far from the Tunji River. It appears that the Ghiliaks dispose of the dead by placing the bodies in trees, like some North-American and Australian tribes, or they burn the bodies.* Mr. Weber, the botanist, took the skull carefully down, and sent it a long journey to Irkutsk, in Siberia, to another exile, Mr. A. Giller, a friend and relative of Dr. Kopernicki, who had been solicited to procure him cranial spoils from that country. Mr. Giller conveyed the calvarium with him to Warsaw, in 1860, where it remained for a length of time; subsequently it was transmitted

* La Perouse found that the natives of the Bay of Castries, which is a little south of the mouth of the Amur, placed the dead in coffins upon a scaffolding made of poles. (*Ante*, p. 30.)

to its owner at Paris, where it was exhibited before the Société d'Anthropologie of that city, on which occasion Dr. Prunerbey presented a precise account of the peculiarities exhibited in the conformation of this rare Ghiliak calvarium. Its travels did not then cease, for I have recently received it from Wallachia, its late home.

In De Pauly's fine volume on *The People of Russia*, we are informed that "the Ghiliaks, or Ghilem, or Kilen, as they name themselves, are perhaps the most essentially fishing people of any in the world. This tribe but a little ago presented all the characters of a nationality almost untouched; but for some years its contact and frequent relations with the Russian colonies founded at the mouth of the Amur, the power of which has risen so rapidly, have induced it insensibly to forget its language and its primitive manners to a considerable degree. The Ghiliaks are probably of the same race as the Kouriles, their neighbours, although to our days they have been considered as an absolutely distinct people. They dwell upon the shores of the Amur, from the mouth of the river to about one hundred and thirty miles up its course, then along the northern shore to a distance of about seventy miles from the river, and towards the south to Cape Lazaret; lastly, on the lower course of the Usuri, and in the northern part of the Island of Saghalien. The first Ghiliak village upon the Amur is Oukhtar, which they inhabit in common with the Mangoutes, or Manguns, whilst a little further down the village of Kereh is exclusively Ghiliak. About forty Ghiliak villages are established along the Amur, and there are about a dozen on the north and south of its embouchure, of which Kol, the most northerly, is situated almost twenty miles from the winter station of Petrovsk. The whole territory of the Ghiliaks is surrounded on the north and west by Tungouse tribes, among whom they seem to be introduced like strangers.

"The Ghiliaks live absolutely in the same manner as the Tungouse of the lower Amur. As a fishing and hunting people they are in the same degree of civilization as these last, from whom they are distinguished by their exterior, and especially by their language, which has not the least affinity with the

Tungouse language, and is remarkable for the quantity of its monosyllables.

"The Ghiliaks are more strongly built and larger than the Tungouse. They have the face broad, or rather squared, and their little black or deep brown eyes are less oblique than those of these last. The mouth, although little and enframed in thick lips, is not generally disagreeable to look at; the nose is short, thick, and turned up; the eyebrows are very thick and strongly arched. The black and thick hair is curled in the greater number; the beard is stronger than among the Tungouses."* The Ghiliaks of De Pauly's beautiful plate are of a light tawny brown colour.

Mr. Ravenstein says, "there are several tribes of Ghiliaks, those of the mainland, the Smerenkur of the west coast of Sakhalin, and the Tro of the east coast, but the distinction between them is trifling. Nor do they differ much in outward appearance from their Tunguzian neighbours; the features are still Mongol, the nose is rather flat, the eyes are small, the lips are voluptuous, the eyebrows bushy, and the beard is stronger than with the Tunguzians; they do not shave the head, but wear the hair tied up into a thick tail or in tresses. The Russians describe their women as frights, but tastes are not always the same, and Rimso, the Japanese, says they are very comely, and doubly attractive on account of their daily ablutions."† They are represented as avaricious, addicted to theft, to murder not unfrequently, and greatly to revenge. The missionary De la Brunière was murdered for the little merchandise he had with him. Rimso says, polyandry prevails among the Smerenkur Ghiliaks, who treat their women with great indulgence; only those skilled in the use of the needle can expect to get married. The children are strapped down to a kind of board and hung up to a rafter of the house.

After these introductory remarks, we may now turn to the craniology of the people of this remote part of the globe. Our Ghiliak calvarium has belonged to a man of about thirty-five

* *Peuples de la Russie*, fol., St. Petersburg, 1862.

† *The Russians on the Amur*, p. 389, 1861.

GHILIAK SKULL.

years of age; there is already much tendency to ossification of the sagittal and lambdoidal sutures; and the teeth, of which seven of the molars remain, are a good deal worn down, not unlikely by a coarse fish diet. The calvarium is a little asymmetrical, being slightly flatter in the right occipital and left frontal regions. The face is broad, and unusually flat on the cheek bones; the space between the orbits wide and unusually level; the nasal bones, barely half an inch of their roots remaining, rising only very gently; the forehead ascends for but a short distance slopingly, when it turns backwards, meets the interruption of the frontal protuberances, and then falls rapidly back towards the vertex, so that, although the frontal region is broad, it much lacks elevation. The temporal regions widen out as they pass backwards from the external orbital processes, and the semicircular lines do not ascend high up on the parietals. The arch of the palate is wide, and there is an exostotic ridge along the outer margins of the alveoli, especially on the left side. The whole calvarium is low and broad; the two parietal bones meet for the anterior half in a slight ridge; it is not a brachycephalic calvarium, still it has a somewhat cuboidal aspect, because its breadth and height are the same, and thus bear the same proportion to its length. The zygomatic arches are unusually robust; there is a distinct paramastoid process on the left side. This general outline of the chief features of the calvarium is given purposely before reading the able and minute description of my friend Dr. Prunerbey, which shall now follow. As two observers are often led to fix a different estimate upon various forms, it may possibly be of some use to mark the writer's doubts where he is not impressed in the same manner with the peculiarities pointed out by this discriminating craniologist; such doubts will, it is hoped, be regarded by Dr. Prunerbey as a homage to truth.

"This cranium certainly presents such a conformation as to engage all our attention: it is voluminous, massive, and very heavy; the lower jaw is wanting; the upper teeth are but little worn (? the dentine is thoroughly exposed in the two first molars, on the right side), when compared with the progress of ossification of all the sutures. In fact, the lambdoid is the only one

remaining open (?). This precocious obliteration is sometimes observed in crania proceeding from the high north; and all the other characters indicate that the individual to whom the skull belonged died in the vigour of life; save a very slight occipital asymmetry, the cranium is normal throughout.

"Viewed in the face the skull offers, in a high degree (?), the lateral contour in the lozenge form proper to the Turanian races. The forehead, receding towards the vertex and towards the temples, is marked by thick, horizontal superciliary arches, confluent at the glabella; great (?) horizontal depression above these arches, and considerable prominence of the frontal bosses above this depression, the distance between the two bosses being only fifty-one millimetres. The root of the nose is flat, very broad, and slightly depressed towards its lower extremity. Nasal bones very narrow (four mm.), and joined on the flat; nose flattened, more even than in some Esquimaux, so that the nasal processes of the maxillaries scarcely exceed the plane of the face by three mm. Orbital cavities placed entirely towards the face, square, with horizontal transverse axes, wider than high, with the lower edge much thickened; the eye has looked forwards; external orbital processes, massive and very prominent; suborbitar foramina very large and placed quite low; region of the malar sinuses flat, broad, high, and without any trace of canine fossa. Nasal spine, without being pointed, elongated downwards, following the palatine suture (the suture between the superior maxillaries); nasal aperture turned out, and the external surface of the incisive alveoli hollowed, in place of being prominent. Considerable inclination and projection of these alveoli, especially those of the canines, which form a right angle between the premolars and the incisors, which are wanting. Teeth strong, curved at the roots in the antero-posterior direction, with white enamel. The canine is thick and notched on the internal surface; the first premolar more voluminous than the second. The wisdom-teeth are small and crenelated on their grinding surface. The form of the palate, which is very deep, approaches to a parallelogram. Before quitting the face let us remark that the glabella projects over the nose, the lower edge of the orbit beyond the upper, and the alveolar border

beyond the nasal aperture; from this conformation there results a face inclined from above downwards, from behind forwards, and really prognathous. Regarded from above, and laterally, the supraorbitary region of the forehead appears to be surrounded with an osseous ring.

"Laterally the malar bone is broad, very high (thirty-four mm.) and inclined downwards and outwards; the temples are flattened, greatly elongated, and their semicircular lines are elevated without approaching so near to each other as in certain Calmucks, Australians, New Caledonians, &c. The branches of the zygomatic arches are broad and strong, their superior edge ascends from behind forwards, without being curved; auditory openings with a wide aperture, funnel-shaped; mastoid processes not thick but long, flat and directed forwards; hence the cranium rests at once on these processes and the occiput, and very probably the incisor teeth will have been supported in the air, without touching the horizontal plane. Parietal bosses, small and projecting upwards in the last third of the cranium; parietal region of the vertex ogival, but yet less so than in the Esquimaux.

"The occiput is slightly contracted, prominent, pentagonal, asymmetrical. Its scaly part is joined to the muscular almost at a right angle. At the base which, in its post-auditive part, is less wide than common in the Mongol race, all the spines, processes, crests, etc., serving for the attachment of muscles, are strongly developed; the occipital condyles prominent and elongated; lastly, there is a trace of an occipital paramastoid on the right side, and the anterior edge of the occipital foramen is more elevated than the posterior. The cranial sutures are very simple, or linear, or with rude and distant dentelures.

"Let us recapitulate all the traits of animality we have observed. These are, without speaking of the considerable reduction of the papyracious lamina and of the almost complete exclusion of the malar from the suborbital fissure, the volume of the first premolar, the form of the palate and of the supraorbital region, the presence of the occipital paramastoid; and,

lastly, the disposition of the edges of the occipital foramen."*

We shall not follow Dr. Prunerbey in his measurements, as there seem to be some misprints in this place, but adopt the method employed with the Aïno skulls.

MEASUREMENTS OF THE SKULLS OF A GHILIAK, SOME ALEUTIAN ISLANDERS, AND A KAMTSCHADALE.

	Ghiliak.		Aleutian Islands. (Von Baer.)		Kamtschadale. (Von Baer.)	
	Inches.	Millm.	Inches.	Millm.	Inches.	Millm.
Length	7·2 =	182	6·9 =	175	6·8 =	172
Breadth	5·6p.	142	5·8	148	5·7	145
Height	5·6	142	5·0	127	5·3	135
Least frontal width	3·9	100	3·6	91	3·8	96
Greatest „	4·7	119	4·3	109	4·6	112
Parietal „	5·5	140	5·1	130	5·2	132
Occipital „	4·9	125				
Zygomatic „	5·6	142	5·5	140	5·8	148
Frontal radius	4·8	122				
Vertical „	4·9	125				
Parietal „	4·9	125				
Occipital „	4·2	107				
Maxillary „	4·2	107				
Fronto-nasal radius	3·9	100				
Circumference	20·8	522	20·4	518	20·4	518
Longitudinal arc	14·9	377	14·0	355	14·2	360
a. Frontal ditto	5·3	135				
b. Parietal „	4·7	119				
c. Occipital „	4·9	125				
Frontal transverse arc	12·7	322				
Vertical	13·2	335				
Parietal	13·8	350				
Occipital	11·8	298				
Cephalic index, latitudinal	·777		·843	·85		
„ „ altitudinal	·777		·721			
Gnathic	·3					
	Cubic Inches.	Cubic Centim.				
Internal capacity	100	1638				

By reducing this internal capacity of 100 cubic inches into its equivalent of brain, making proper allowance for the membranes and fluids, we arrive at the weight of the brain which has been contained in this Ghiliak calvarium, which is 51·51

* "Description d'un Crâne de Ghiliak, et note sur les Ghiliaks." *Bulletins de la Société d'Anthropologie*, t. 2e (2e série), p. 571.

ounces, or 1460 grammes. The result of this investigation is to show that this individual Ghiliak has had an unusually large brain; even among European skulls it would be large. It has exceeded in weight the average brain-weight of males of Oceanic races, Australian races, American races, African races, and even Asiatic races, being surpassed solely by the males of European races. In examining the calvarium itself, it becomes apparent that it owes this unusual capacity to its cuboidal form.

In its general configuration, this calvarium is at once seen not to belong to any European race. It is quite unlike the dolichocephalic skulls of western Europe. It does not conform to any African, Australian, Oceanian, or American race, nor to the skulls of Chinese or Japanese. Yet it evidently belongs to a rude race, as is apparent from its bony angularities. This race must be distinguished for considerable flatness of face. Although it cannot be strictly paralleled with any other example known in the museums of Europe, it will be desirable to compare it with known skulls derived from the same region of the world,—the skulls of Tunguse, Kamtschadales, Aleutians, and Aïnos.

1. As the Tunguse live nearest to the Ghiliaks, they may be taken first. Blumenbach's museum contains two Tunguse skulls. One of these has been etched in his *Decades Craniorum* (tab. xvi), and also in his *De Varietate Nativa* (ed. 3, tab. ii, fig. 1). But this skull was derived from the neighbourhood of Lake Baikal, at a great distance from the Gulf of Tartary. Neither of these figures is a direct profile; they are, however, taken at different angles. They both agree, in some measure, with our Ghiliak,—in the flatness of the face, in the small, low nasal bones, and in the wideness of the forehead; besides which are seen the robust zygomata, and the great prominence of the external orbitar processes, the general conformation of the calvarium being much the same. There are, at least, three Tunguse skulls in the museum of the Imperial Academy at St. Petersburg, but these have not been either described or figured.

2. The calvarium of the Kamtschadale of Blumenbach's

"Decades Craniorum" (Tab. LXII), in all its prominent features, closely resembles the skulls of the Aleutian Islanders depicted by Choris and Von Baer, more so than that figured by Van der Hoeven; and it agrees in general form with our Ghiliak, which, nevertheless, has a better elevation of the frontal region, but less eminent nasal bones.

3. The Aleutian islanders in the sea of Kamtschatka. In the "Voyage Pittoresque autour du Monde" of Choris, which is the atlas of Kotzebue's voyage, there is a plate representing two skulls of the inhabitants of these islands,—one seen in face, the other in profile (*Isles Aléoutiens*, pl. vi). The lithograph is poorly executed, and it is probable that both figures are taken from one cranium. But allowing for the imperfection of the execution of the plate, there is no doubt that the form of the skull is correctly given, and this is sufficiently singular to attract much attention. It is a considerable exaggeration of a cranial form which appears to prevail in this region of the globe. The width of the face; the very widely separated zygomatic arches; the flatness of the nose; the extreme want of elevation of the frontal region which, after rising at the supraciliary ridge, falls away in a rapid slope towards the vertex, even after the figure is recalled to its normal position; the prominence of the parietal protuberances; the breadth of the calvarium, combined with its lowness, are all most characteristic features.

There are five skulls of Aleutian islanders in the museum of the Academy of Sciences of St. Petersburg. One of these, a calvarium, has been figured by Professor Von Baer. He has given three plates of it of the full size,—a profile, a face view, and a vertical view.* These exhibit the same flatness of face as our Ghiliak, the same small, low nasal bones, the same lowness of forehead, and the same roof-like elevation of vertex; the same robustness of the zygomata and prominence of the external orbitar processes. Professor Van Baer has projected the outline of another Aleutian island skull, from the island of Atchen, upon the vertical view, which proves it to be much shorter. His measurements vary a good deal from those of

* *Crania Selecta*, 1859, Tab. 14, 15, and 16.

our Ghiliak. The length of his first specimen is 6·8 in., that of second, 6·6 in.; the heights of the two are respectively 4·9 in. and 5·2 in., and the breadths respectively 5·2 in. and 5·4 in. From these dimensions it is obvious that both these examples are much smaller than our Ghiliak. The cephalic indices are respectively ·72 and ·78. Van Baer's means are given in the preceding table.

He compared the skulls of the Aleutian Islanders with those of Calmucks, and points out one or two resemblances and many differences. He next compared them with the cranium of a Japanese, which is figured in the great work of G. Sandifort, as the Aleutian Islanders have been said to resemble the Japanese, and points out the much more upright forehead and higher calvarium of these latter. He, lastly, compares the Aleutian island skulls with the Kamtschadale figured in Blumenbach's Table, and finds a considerable resemblance between the two. He procured the measurements of the Kamtschadale calvarium, which have been repeated in our table.

The late Professor J. van der Hoeven described the skull of an Aleutian Islander, and added a profile and vertical view of the same, with measurements.* This complete cranium, which is in the Rijks Museum, at Leyden, presents a certain degree of resemblance to the figures of Choris and Von Baer. Its most important difference is seen in the unusual elevation of its frontal region. The nasal bones are narrow, not much elevated, and rather long. In the *norma verticalis* it considerably resembles our Ghiliak.

Although there is some general resemblance of form among these skulls, the Tunguse, the Kamtschadale, the Aleutian Islanders and the Ghiliak, the measurements convince us that there must be a great diversity of proportions in the series. The Ghiliak skull is dolichocephalic, whilst both the Kamtschadale and the Aleutians are brachycephalic. And it equally results from the measurements of a series of skulls of Tsuktshi recorded by Professor Jeffries Wyman, that they also are brachycephali, having a mean index of 80·3.† From this comparison

* *Beschrijving van drie merkwaardige menschelijke Schedels.*

† *Observations on Crania*, 1868, p. 22.

we are justified in concluding that, although there may be some degree of resemblance, there is still a considerable diversity of cranial form among the tribes inhabiting the remote eastern regions of Asia and the surrounding islands. It is true that, up to the present time, very trifling materials have been collected to elucidate the subject, nevertheless this conclusion may be confided in.

4. When we pass to the skulls of the *Aïnos*, who are a people living in the same immediate neighbourhood, a people occupying the southern end of the same Island of Saghalien, the northern extremity of which is the dwelling place of different tribes of Ghiliaks, we meet with a difference of cranial conformation which is quite remarkable. The skull of the Aïno, as described in the preceding memoir, offers no similarity worth naming to the broad and flat-faced Ghiliak. On the contrary, it exhibits a considerable resemblance both in the face and the calvarium to our European forms. The difference between the Aïno and the Ghiliak is so important and extends over so many features, that, at the risk of being somewhat tedious, it will be desirable to pass over these features separately, to make the differences fully obvious. In describing the complicated forms of the human skull, it is only by very careful and patient enumeration that they can be duly estimated, and it is always difficult to convey by words that which may be at once perceived by the eye.

In the Ghiliak there is a broad flat surface, or plane, upon the superior maxillary bones covering the sinuses, which is seen in a very inferior degree, or may, indeed, be said to be wholly absent in the Aïnos. The facial surface of the malar bones is considerably less in these latter. Measured obliquely from the edge of the orbit to the free space below the zygoma, in the Ghiliak it is 37 mm. In the male Aïno (No. 1432) it is only 32 mm. The distance between the orbits in the former is 30 mm., in the latter it varies from 27 to 28 mm. The orbits of the Aïnos are more like those of Europeans. The frontal region is tolerably well elevated and prominent in these latter; in the Ghiliak it is low and recedent. In the *norma verticalis* the Aïnos skulls exhibit the regular, smooth, ovoid forms of those of Europeans, whilst the Ghiliak is less regular, and has upon the

whole a more angular aspect. The mean cephalic index in the three Aïnos male skulls is the same as that of the Ghiliak man, viz., ·77.

Whether the essential differences between these two distinct series of skulls have been made very clear by this description and the accompanying figures may still be somewhat uncertain, although it is hoped that it will have been rendered tolerably plain. But, when the skulls themselves are presented to the eye of the observer, they appear to appertain to distinct varieties, and to have no connection, or scarcely any connection, with each other. We have not been able to trace any gradation from one form to the other. The two remain clearly marked out as distinct, quite as distinct as the mild character of the Aïnos, from that of the treacherous and cruel Ghiliaks. They must both be regarded as primitive peoples, for the wildest imagination can hardly conceive of either of them having migrated—of an European tribe, for instance, having roamed to such a very remote and inaccessible region of Asia and planted itself there—still less of their having migrated from two different and opposite sources. Hence this important fact of the presence of two different primitive peoples living in the same island, where they have uninterruptedly resided for an unknown and indefinite antiquity, who are strikingly contrasted in their most essential forms, must be added to the large number of facts of the same kind, which are continually presenting themselves in the survey of human races. No system of anthropology can be of any value whatever which will not embrace a vast multitude of facts of this kind.

The weight of the brain in these remote Asiatic peoples is alone sufficient to prove that they are not degenerate remnants of some former more highly-endowed race. On the contrary, they possess fair average sized brains, *such as are proper to the races*, not falling materially below the mean volume of European brains. The general average deduced from the internal capacities of 299 skulls of European men is a brain-weight of 48·25 ounces; the mean of the three Aïnos skulls is 45·83 oz., and that of the male Ghiliak skull is 51·51 oz., which is, as before explained, no doubt, an exceptionally large example.

XXV.—*On the Headform of the Danes.* By Dr. Beddoe, President of the Anthropological Society of London.

Measurement of the living head, though of course much valued by phrenologists, has on the whole been strangely neglected by the students of comparative anthropology. The presence of the integuments, and the extreme difficulty of finding fixed points, in bodies presenting almost everywhere curved and convex surfaces, prevents any satisfactory system of mensuration from being devised, and scientific men have generally passed by such measurements as worthless, or, at least, as almost infinitely less valuable than those obtainable from the bare skull.

But in most countries, civilised as well as uncivilised, skulls are not procurable without much difficulty; and the authentication of the race and birthplace of the original proprietor of a skull is very often impossible. In several civilised countries, and particularly in our own, few crania, save those of lunatics, idiots, paupers, or malefactors (all unsatisfactory specimens of a race), have ever been measured or catalogued. Under these circumstances, it is surely very desirable that some plan should be devised whereby the abundant material on the shoulders of our fellow-citizens may be utilised to the full limits which the obstacles, opposed by nature, will permit. Such simple questions as those of the relation of breadth to length in the European races, for example, might thus be solved almost immediately; whereas we may have to wait half a century before we can accumulate crania numerous enough for their settlement.

The system of measurement I practise is my own; it has been gradually arrived at through many additions and variations, and its present form has received the valuable approval of my friend Pruner-Bey. All I can claim for it, however, is that it is expeditious and convenient in application, not requiring the aid of any implement more costly or less portable

WESTERN ISLESMEN.

	No.	Birthplace.	Mast.	Circumference. Gl. Po.	Fr. In.	Gl. In.	B. D.	Arcs. Naso-Inial.	Inter-helical.	Inter-meatoid.	Cephalic Index.
Sleswickers. Jutlanders.	1	Aarhaus	5·1	21·7	21·5	21·4	21 6	13·3	12·2	14·1	81·4
	2	Ditto	4·9	22·6	22·5	22·7	22·5	14·6	12·5	14·5	75·6
	3	Fredrikshavn ...	5·3	22·5	22·3	21·8	22·4	14·9	12·8	14·6	75·6
	4	Near Skag Point		23·9	23·4	23·4	23·7	14·3	12·5	14·7	82·5
	5	Apenrade	5·5	22·3	22·1	22·2	22·1	13·2	12	13·8	81·5
	6	Ditto	5·2	22·6	22·2	21·8	22·3	14	12·6	14·4	81·7
	7	Near Apenrade..	5·15	22·8	22·6	22·6	22·7	14	12·8	14·7	82·2
	8	Sonderborg ...	5·6	23·3	22·8	22·9	23	14·4	13	14·8	82·6
	9	Flensborg	5·4	22·8	22·2	22·2	22·7	14·1	12·2	14·2	79·5
Isle-Danes.	10	F. Kjobenhavn M. Apenrade	5·2	22·1	21·9	21·6	22·3	14	12·2	13·8	83·5
	11	Kjobenhavn ..	5·7	23	22·6	23·1	22·6	14·9	12·4	14·8	79·5
	12	Ditto	5·7	23·5	23·2	23·3	23·3	14·2	13	14·7	83·3
	13	Siœlland	5·4	22·7	22·4	22·5	22·6	13·2	12·4	14·5	84·3
	14	Helsingör	5·15	21·6	21·4	21	21·5	13·5	12·2	13·6	81·5
	15	Middlefart Fyen	5·1	23·2	23·1	22·7	22·9	14·5	13·2	14·8	83·6
	16	Langeland ..	5·4	23·5	23·2	23	23·3	15	13·8	15·4	75·9
	17	Moen	5·6	22·5	21·8	22·1	22	13·5	11·9	14	77·9
	18	Laaland	5	21·8	21·5	21·5	21·6	12·9	11 4	13·3	79·6
	19	Lœssö...	5·3	22 3	22·4	22·1	22·3	14	13·5	15	85·9
	20	Bornholm	5·2	22·3	22·2	22·2	22·4	14	12·3	14·2	75·3
	21	Ditto	5·7	22·75	22·75	22·7	22·7	14·2	12·5	14·3	79·4
	22	Amak	4·9	22·4	22·5	22	22·4	14·5	12 8	14·5	80·2
	23	Ditto	5·3	22·4	22·2	22·1	22·3	14·3	12·1	14	78·9
West. Islesmen.	24	Romö	4·8	22·4	22·2	21·8	22·2	13·7	13·2	14·2	77·6
	25	Ditto	5·4	22·1	21·9	22·2	22				83·1
	26	Fanö	5·6	23·4	23 3	23·4	23·1	14·4	12·3	14·2	81·4
	27	Ditto	5	22·7	22·4	22·4	22·5	13·3	12·8	14·8	81·1
	28	Ditto	5·8	23·3	23·2	23·1	23	14·1	12·8	14 7	82·3
		Averages of fourteen	5·33	22·57	22·36	22·27	22·37	14·05	12·55	14·35	80·6
		Ditto of fourteen Jut	5·22	22·76	22·47	22·42	22·63	14	12·55	14·40	80·5
		Ditto of the twenty-	5·27	22·66	22·42	22·34	22·50	14·02	12·55	14·38	80·5
		Ditto of ten from th	5·21	22·65	22·43	22·47	22·42	14·44	12·37		78·4

few North Germans, have settled in the country since certain Wends colonised Laaland and Falster in the thirteenth century. Nevertheless, it will be observed, that great variations in the modulus of breadth occur in the series, and in almost every division of it. For my part, I believe such to be the case in every race, however pure. The resemblance between the averages of the fourteen Isle-Danes and the fourteen western men, is sufficiently near to lead me to think that I have really approached the true average of the maritime population. It is not unlikely that the Jutes of the interior and west may be longer-headed.

The average stature of fourteen, known to be aged 23, or upwards, was 5ft. 6·9, or 170 centimeters,—a fair average for Great Britain. The mainlanders were generally taller than the islesmen. The eyes were almost always light, and either blue or blueish-gray, and the hair generally either pale yellow or light brown. The only person of dark complexion was the man from the Isle of Moen, to whom I will return presently. The prevailing form of face was the spade, broad in the forehead, broader at the cheekbones, and tapering thence, with a gradual and regular curve, to a well-marked chin. The same form prevails in Sweden and Shetland, and in some parts of Cumberland and East Yorkshire. It was most marked in the Schleswigers, who were all fine men, and reminded Dr. Davies and myself of the old Norman type. The nose was slightly aquiline in the Schleswigers, straight in the Jutes, variously formed, and sometimes concave, in the islesmen.

If I were to attempt to classify the heads under any certain types, I should place them all, except that of the Moen-man, under two: one of these is elliptic, or rounded-oblong in section, resembling the Saxon type of Lubach; the other approaches the Frisian type of Lubach, and has some resemblance to the oval Celtic type of Wilson and of myself, though the distinct protuberance, which is apt to occur at the point of greatest breadth, is placed rather more forward than in the Celts. In the finest men, the head was elliptic in section, but the features were rather Frisian than Saxon.

One man (No. 4) from near the Skag point, in the Vend-

syssel, was a magnificent specimen of humanity; his head and face closely conformed to the heroic type of the Greeks. The folk of the Vend-syssel were formerly called Vendels, and were probably identical with the Vandals; but whether the Vandals were Slavonic or Scandinavian, I will not pretend to decide, though I incline to the latter view.

The inhabitants of the Isle of Amak are said to be descended from a Hollandish colony. My two Amagers were of the Saxon type. The Loessö-man was remarkable for his harsh features, pentagonal face, and large parietal tubers. Of the Bornholmers, one had rather oblique eyes and a thick flat nose, but he had nothing else of the Tartar about him: the other was a good example of my second type; his face was spadeformed, his temples rather flattened laterally, his nose aquiline, and brows prominent though arched: he might equally well have been a Frisian, or a Swede, or an Englishman, not untinctured with Celtic blood.

The Moen-man differed *toto cœlo* from all the rest. His complexion was swarthy, his eyes dark and obliquely set, his hair dark, thick, and curly, his face oval, nose cocked, brows and cheekbones prominent, lips thick; forehead squarish, low, and receding; head rather narrow and pyramidal, with the point of maximum breadth set far back. His appearance did not at all suggest the presence of Negro blood; but he would have passed unnoticed in some parts of Connaught or South Wales; and his head reminded me of the primeval skulls disinterred at Borreby, in Moen. Was he, in truth, a descendant of that ancient tribe?

THE END.

XXVII.—*On the Stature and Bulk of Man in the British Isles.* By John Beddoe, B.A., M.D., F.S.S., President of the Anth. Soc. of London.

Prefatory Chapter.

The plan of the present work originated in the following way:—In the year 1860, Dr. Barnard Davis, in view of the chapter in the "Crania Britannica," entitled *Ethnological Relations of the present population*, conceived the idea of printing and circulating certain queries as to the physical characteristics of the natives of various portions of Britain. He did me the honour to submit his scheme for my consideration and approval; and we subsequently circulated a good many copies of his "ethnological queries," and obtained thereby a good deal of valuable material, an abstract of which may be found in Decade vi of the great work above-mentioned. I had, however, been struck by the unlooked for, and, as I thought, interesting and anthropologically important character of the information bearing on the stature of man, which had thus been obtained; and I resolved to carry on the inquiry into that branch of the subject on a more extended scale, by the circulation of blank tables, to be filled up with particulars respecting a number of specified individuals.

The formula I adopted was as follows:—Surname, age, birthplace, occupation, height (in feet, inches, and quarters), weight (stones and lbs.), colour of eyes (blue, grey, dark grey, or brown), colour of hair (red, fair, brown, dark, or black. *Directions:* Only men between 23 and 50 to be measured; they are to be taken indiscriminately as to size, big and little as they occur, so as to yield an average sample of the population, or of the class observed; mention whether measured in shoes or not.

The returns, however, came slowly in; and I applied for assistance in circulating the schedules to Dr. Hunt and Mr. Carter Blake, then President and Secretary of the Anthropological Society. Copies of my schedule were distributed,

through their aid, to all the Fellows of the Society, at that time already above five hundred; but, except returns from Sir Duncan Gibb, Bart., and from one anonymous correspondent from Ireland, their appeal bore no immediate fruit.* I therefore fell back on my own resources, carried out an extensive series of measurements, in the workshops of Bristol, and on all the men, available for my purpose, whom I encountered in the course of my professional work at the Bristol Infirmary; and applied to a number of my medical and other friends in various parts of England and Scotland, and to a few other medical men, personally unknown to me, but distinguished by their zeal for natural history or science in general. For the exertions which many of these gentlemen made to assist me in my object, I cannot sufficiently thank them: their names will appear in connexion with their respective contributions; but I ought here, perhaps, to mention several of them who, though they did not all personally contribute to the work, were nevertheless of the greatest possible service to me, by procuring from friends of their own unconnected with myself, some of the most valuable of the reports. Among these were Dr. Barnard Davis, F.R.S., Dr. Arthur Mitchell, the Rev. Canon Greenwell, the Rev. J. Percival, of Clifton College, Mr. Philip J. Worsley and Mr. John Bowman, both of Clifton, Dr. Johnson, of Shrewsbury, and Professors Cowan and Gairdner of Glasgow, and Struthers of Aberdeen. I subsequently carried the inquiry into two other regions, and with the help of Dr. Maudsley and others, procured details of the stature, bulk, &c., of the inmates in most of our county lunatic asylums. The official recruiting statistics appearing to offer another and a very important field, I made application through the War Office, to the proper authorities for permission to obtain and make use of them. In this I was successful, owing to the friendly interest of a number of gentlemen, among whom I ought to particularise the late Director-General of the Medical Department, Sir James Gibson, Deputy Inspector General T. Graham Balfour, M.D., (who has himself, among his multifarious contributions to statistics, done much on this subject);

* Ultimately, however, I was assisted by several of the Fellows.

Dr. Kirk, H. M. Vice-Consul at Zanzibar, and Mr. Norman Lockyer, F.R.S. In availing myself of the opportunities thus courteously granted me, I was greatly assisted by Inspector-General S. M. Hadaway, Deputy-Inspectors-General S. Currie, M.D., J. D. McIlree, H. C. Reade, and W. L. Langley, M.D., and Staff-Surgeons-Major B. W. Marlow, M.D., and P. Sinclair Laing; and in the classification of the facts obtained I had the valuable assistance of Dr. David Christison. These facts embraced the necessary particulars respecting every recruit or re-enlisted man of twenty-three years and upwards, who was inspected in the United Kingdom during a period of two years, commencing in March 1864, when the standard was reduced to five feet five inches. While the standard was kept at five feet six, it approached too nearly to the average height of the natives of most parts of the British Isles, to afford data of any value for such an investigation as mine; and for all periods prior to March 1864, either the standard was too high or the information in the recruiting books on other points was defective. With respect to limits of age, the observations of Quetelet, Danson, and Aitken, seem to me to indicate the age of twenty-three as that when the average man has attained his full stature and bulk, if not absolutely and always, yet nearly enough for purposes of practical investigation. In fixing on fifty as the upper limit of ages admitted, I had little to guide me except Dr. Boyd's paper in the *Philos. Trans.* for 1861, and the current opinion, which, basing itself perhaps on the old doctrine of climacterics, regards forty-nine or fifty as the point when the decline of life fairly begins. Hospital practice of course makes one comparatively too familiar with constitutional weakness and early decrepitude; and my impression that the inhabitants of towns on the average begin to decline rather before than after fifty may therefore be erroneous. Dr. Boyd's figures would lead to the inference that in the class of people met with in the Marylebone Workhouse Infirmary there is a considerable difference in stature between the men of forty to fifty and those of fifty to sixty, while in the Somerset Lunatic Asylum no such decline is observed. Hard work, exposure, and perhaps peculiarities in the food, bring on the *appearance*

of age much earlier in some agricultural districts than in others; and this I have particularly observed in Berwickshire as compared with some parts of England, though the former produces a breed of men unsurpassed in size and vigour.

The data procured from the recruiting books, and those from the lunatic asylums and prisons, have been of great value to me, as will be seen in the commentary subjoined to my tables; but they have but a remote bearing on the question, what is the average stature of man in the several divisions of the United Kingdom. For this part of the subject I have had to rely almost entirely on the schedules filled up from among the civil, sane, and free population; and I must confess to a feeling of satisfaction not unmixed with wonder, when I contemplate the extent of the material thus brought together. I have been asked more than once, by those who took an interest in the progress of the work, why I did not endeavour to further utilise my own labours and those of my correspondents, by collecting at the same time information on some other points of importance, such as the size of the head and the girth of the chest. I had two reasons for not attempting this. In the first place, no two men exactly agree in their measurement of the same head or chest. The directions of the recruiting department on the latter point appear to be as precise as possible; but the internal evidence of the official books has convinced me that two inspectors, equally experienced and skilful, may differ greatly in the results they obtain in following out those directions. But my principal reason for not attempting anything of the kind was, that the difficulties in the way of my correspondents, and the trouble entailed upon them, were already very great, and that by asking too much I should in many instances have deservedly failed to obtain the favour willingly granted to a more moderate request. Most of my allies were country doctors, members of a class which, though much overworked, is perhaps above all others ready to respond to claims made on it in the name of either science or philanthropy. These impediments were great and very various in kind and degree. The want of ready access to a weighing machine was one frequently alleged. It was perhaps a mistake to insist

upon the weight being taken, though some interesting facts resulted from that part of the inquiry; for the height alone could have been much more easily gotten. But much more important difficulties arose from the character of the people to be examined, and some of these are perhaps worthy to be recorded, and may even have some anthropological interest.

A very large proportion of my best and most elaborate contributions came from Scotland. There, as elsewhere, I distributed a certain number of schedules without receiving any answer from the persons applied to; but those who did send answers almost all promised assistance, and with very few exceptions I believe they all carried out the engagement. The lower classes in Scotland are, as a rule, both intelligent and obliging; the men examined generally took interest in the matter, and in only two districts did I hear of any difficulty being raised by them. The fishermen, however, of some villages on the east coast, proved extremely stubborn and suspicious; "nothing less than an act of parliament would do it," remarked one of my allies, Dr. Howden of Montrose. "Waste of workmen's time" was alleged as an objection by a Glasgow manufacturer.

In Ireland the unsettled political condition of the country proved an insuperable obstacle to those who made attempts on my behalf. Some Tipperary "boys" fairly took to their heels when it was proposed to measure them.

In England generally a good many of those who at first promised assistance subsequently failed to carry out their engagements, finding the task more difficult than they had expected. These cases occurred chiefly, I think, in the east of England. In the same region, and particularly in the anthropologically important county of Kent, I found unusual difficulty in getting people to take enough interest in the subject, or to comprehend its bearings sufficiently, to be induced to make the attempt; the same was the case in Herefordshire and some other counties, where a wearisome series of efforts on my part failed to elicit a response. In the south-east of England some of those who did make the attempt reported that the "shyness" of the *and gentry was* insuperable, or that they obstinately refused

without reason assigned, but apparently from some superstitious motive. In the south-western counties, there was generally little difficulty :* the lower classes there are, as a rule, courteous and obliging, though, except in Cornwall, perhaps not remarkably intelligent. In Wales there was unusual difficulty in disabusing the natives of the idea that the inquiry had been set on foot by "Government," and therefore *must* mean mischief; that the men measured would be carried off for recruits or exported to America, &c.; when this difficulty could be got over there was no further objection. It was a long time before I could procure much material from Yorkshire, though I did ultimately receive thence a large number of very valuable contributions. In certain parts of the county my correspondents blamed the rugged rudeness of the people, miscalled by themselves independence, as the cause of failure. In Lancashire the jealousy or indifference of employers, and the rudeness or ignorance of workmen, have made my endeavours comparatively fruitless. But the bucolic and Bœotian county of Hereford is the only one from which I have failed to obtain any return whatever.

Roughly speaking, I should say that failures, where they occurred, were attributable, in Scotland, either to greed of time or to superstition; in Ireland, to carelessness or to political feeling; in Wales, to suspiciousness, and in England to stupidity.

By all these difficulties I have been prevented from fully carrying out one of my original ideas, which was to get samples of similar classes, and especially the peasantry, from each of a number of districts strongly marked in race character. And some interesting districts, such as Orkney, East Caithness, Lochaber, Holderness, Thanet, Lower Pembrokeshire, are either insufficiently or not at all represented, from no fault of my own. On the other hand, I have returns from the most remote of the islands, as the Shetlands, the Hebrides, St. Kilda, and the Scillys; from the villages most elevated above

* According to my friend Mr. D. Mackintosh, F.G.S., the cultivators of natural science are far more numerous in the west than in the east of England.

the sea, viz. Wanlockhead, Allenheads, and Braemar; from the lowest districts, as Romney Marsh and the Fens; and from districts more or less peculiar as to race, as Flegg and Spitalfields; or as to mode of life, as New Forest, Sheffield, and the fishing villages of the east coast. So much for what may be called the extrinsic difficulties of the investigation; the consideration of the intrinsic ones may be deferred till we have before us the collected material, or, at all events, until I have stated the objects of the inquiry.

These were, in the first place, to furnish some reliable features towards the composition of a picture of the physique of the British population in its several races and districts, before those races might have been, through the greatly increased facilities for interrogation and cross-breeding, so amalgamated as to have lost all sharpness of distinction. It is probable that more has been done in England, since the beginning of this century, or even during the present generation, towards breaking down these distinctions in a general fusion of race elements, than had been done during the preceding six centuries. And the process goes on year after year in an accelerated ratio, as the relics of the laws of settlement are being swept away, and as travelling grows easier and cheaper, and education more general. I wished to furnish standards of comparison for future observers, who might interest themselves in the physical status of the British people, or of portions of it, whether from scientific or philanthropic motives.

I wished also to do for Britain what a distinguished band of anthropologists, of whom Broca is the chief, had been doing for France, viz. to gather evidence as to the respective or relative potency, in influencing human stature, of race and of what the French call *media;* as to the degree, that is, in which hereditary influence can overcome, or is overcome or modified by, such agencies as climate, soil, occupation, and food. Here-

under arise a number of branches of inquiry, interesting alike to the naturalist, to the physician, and to the philanthrope. What is the kind and amount of physical degeneration, if any, which is taking place in the population of our rapidly-growing cities? Is it accompanied with any notable alterations in size, form, or colour? Can we at all separate the effects of the numerous agencies which most people believe to be active in this process, such as foul air, confined posture, working of children, syphilis, alcohol and tobacco? How far do such causes act directly? or how far through natural selection?

The method of investigation which I have adopted cannot be expected to furnish solutions of all these questions, but it may probably advance us a stage further on the road toward such solutions.

I had yet another subsidiary motive. It was the wish to be able to form an estimate of the proportion of serviceable young men shut out from the army by the regulations as to stature. The subject is of national importance, though it was not, I believe, adverted to in the Report of the Parliamentary Committee on Recruiting.

To return to what I have called the intrinsic difficulties of the investigation. The most important one is that of getting, and being sure that one has gotten, a really fair and average sample of the population, or of a particular class. I have generally left to my correspondents the choice of means to this end, or at most have suggested two or three courses for choice. Most of them have aimed at a sample of the general population, and have picked up men for their purpose just as chance and opportunity favoured them. This plan might be supposed likely to yield rather too high averages, dwarfish men being more likely to shun the measurer than tall ones; but I believe this objection is not of very great moment. I was myself disposed to think some of the returns from Scotland, made in this

fashion, erring by excess; but the facts that the highest return in Scotland, or in all Britain, (No. 54) is unexceptionably fair; that in the two next (57 and 50) special pains were taken to avoid this fault; and that in another (52) in which the results appear rather high, all possibility of error was guarded against by the inclusion of the entire population, have inclined me to alter my first impression. The highest among the English returns, *e.g.*, those from Richmond, Bentham, Flegg, and Scilly, were all made by observers of the highest class, who were confident of their accuracy.

To get a true average of the general population a larger number is required than of a particular class; as it is certain than in some districts the upper and middle ranks exceed the lower rank in stature. I say in *some* districts only; because in those parts where the peasantry are of a tall race, the gentry being somewhat mixed in breed, and nearer to the general standard of their class, have not always the same superiority.

In comparing the statements of different observers some caution must be exercised. I have already remarked on the discrepancy of the results, as to girth of chest, obtained by two skilled observers from two sets of men; who, alike in stature, weight, nationality and occupation, *must* have had nearly the same average chest-girth. This difficulty does not obtain to the same extent in regard to stature and weight, but one man is content with less exactitude in these matters than another. In a few of my returns the particulars are given in inches and stones only, the want of good weighing-machines having probably prevented a closer approximation. But the greatest discrepancies occur in the ideas of different observers respecting colour, and especially colour of hair. There is no standard of reference as to the nomenclature of hair-colour, except that of M. Broca; and it would have been both expen-

sive and otherwise inexpedient to have distributed his chromatic scale to all my contributors. The internal evidence of the reports, together with my own observations in this department, which have extended to most parts of the British Islands, have enabled me, however, to make more use of the evidence as to colour, than would at first sight have seemed practicable.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
1.	Island of Unst, Shetland	Mixed Population, but chiefly fishermen	31	5 8·08		156·87	1·7226	66·61
2.	Reawick and Lunnasting, Shetland	General Population	21	5 8·54		159·66	1·7292	67·85

No.	REMARKS.

1. I owe this interesting return to Thos. Edmondston, Esq., of Buness, F.A.S.L., etc. The measurements and weights are taken with great exactness, and the specimen is evidently a perfectly fair one. The men were mostly measured in "rivlins," *i.e.*, sandals, or mocassins of hide. I have allowed ·3 inch for them, and 10 lbs. for clothing. In 36 men the colour of the eyes and hair were as follows:—

Hair	Red.	Fair.	Brown.	Dark.	Black.	Total.
Eyes...Blue	2	7	14			23
„ Grey		1	4			 5
„ Hazel or Brown			3	1	4	 8
Total	2	8	21	1	4	36

The fair men are conspicuously tall, and the black-haired men very small. Average circumference of the head, 22·5 inches. The race in Unst is nearly pure, the frequently Scotch surnames having been mostly borrowed, according to Mr. Edmondston.

2. These tables were compiled by the late lamented Dr. Spence, of Lerwick, for Dr. Barnard Davis. I have struck out a large number of men as over or under age. I believe these men were measured in rivlins, for the most part, and I have allowed ·5 inch and 10 lbs. for shoes and clothing. In 50 men, the eyes and hair were as follows:—

	Yellow.	Fair.	Brown.	Dark.	Black.	Total.
Blue	9	4	17	4	4	38
Hazel, Brown, or Black		2	5	1	4	12
Total	9	6	22	5	8	50

The prevailing colour of the hair in Shetland is a light yellowish brown, but coal-black does occur, though some of those cases set down above as black were probably dark brown. So far as I have observed, the black-haired Shetlanders are of low stature, with features approaching the Finnish type, and a melancholic temperament. The average circumference of the head in fifty men was 22·5 inches.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
3.	Uig, Lewis	Peasants of the clan Macaulay	12	5 7			1·6837	
4.	Scarpa, Harris	Peasants and fishermen, or both	20	5 8			1·7091	
5.	St. Kilda	Fowlers and shepherds	?	5 7			1·6837	
6.	North Uist	Farmers, etc.	6	5 8·46		168·0	1·7145	70·75
7.	South Uist (1 from Benbecula)	Farmers and peasants chiefly	23	5 9·28		164·9	1·7353	69·35
8.	Barra	Mostly fishermen	17	5 9·63		175·4	1·7442	74·11
9.	Total of Uist Group		46	5 9·34		169·1	1·7368	71·25

No.	REMARKS.
3. 4. 5.	I have extracted these measurements from the *Crania Britannica*, cap. vii, pp. 206-209, where may be found a great deal of interesting information as to the physical and moral characteristics of the Hebrideans, collected for Dr. Barnard Davis by Capt. Thomas, R.N., and Dr. Mitchell. I believe the men were measured in shoes, for which I have allowed $\frac{3}{4}$ inch. The stature is said to be taller and the frame bulkier in the district of Ness, where a light-haired Norse type prevails, than in Harris and the remainder of Lewis. In some parts (Barvas) Capt. Thomas's informants estimated the stature as low as 5 feet 6 inches.
6. 7. 8. 9.	These items (6 to 9) are compiled from two schedules, the larger of which I owe to Colin MacRury, Esq., physician in Barra, and a native of South Uist; the smaller, including most of the South Uist men, to a correspondent of R. Gray, Esq., Glasgow. Both returns are carefully taken, and have all the appearance of being fair samples. I have allowed 1 inch for shoes, and 12 lbs. for clothes, by Dr. MacRury's directions. The two observers differ a little in their nomenclature of colour; in the following table I have reconciled the difference as well as I can :—

Hair	Red.	Fair or Brown.	Brown or Dark Brown.	Dark or Black.	Total.
Eyes, Blue or Grey	2	15	2	4	23
„ Dark Grey		2	7	3	12
„ Brown or Dark		3	4	3	10
Total	2	20	13	10	45

The smallest and some of the largest men are fair; but on the whole the brown men are the tallest, and the black men shortest. According to Dr. MacRury's system of colours, the Barra men at least must be a decidedly fair race in the main. What are the proportions respectively of the aboriginal, Norse, and later Gaelic elements, there are no historical data to show. Attempts have been made (*Cran. Brit.*) to estimate them from the physical aspect. That the Norse element must be strong is proved by the fact that "almost every islet and even every farmsteading bears a Norse name." The list of surnames in my

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
10.	Skye	Miscellaneous, from several reports	8	5 9·68		157·7	1·7480	66·67
11.	Lochbuy, Mull	Farmers, shepherds, fishermen, etc., on the estate of Mac Laine, of Lochbuy; all of genuine Mull descent	30	5 9·55		184·0	1·7422	78·01
12.	Colonsay	Mixed	20	5 8·9		174	1·7282	73·93

statement that there is an admixture of mainland blood.* Red hair seems to be rare in the Hebrides, and the only two examples in these schedules bear Argyleshire names. The food of the Barra men consists chiefly of potatoes, fish, and milk; barley-, oat-, and maize-meal, and flour, are less used, and meat rarely.

10. Though I insert this, I believe the average height indicated is far too large; ·9 inch and 10·7 lbs. allowed. Average of eight reapers from Skye, 5 feet, 7 inches; and 151 lbs. (Johnston, *Phys. Atl.*)

11. Contributed by Archibald MacPhail, Esq., Scalasdale, Lochbuy. The height is taken to half an inch, the weight to a pound. The great weight is not owing to the inclusion of corpulent men, but to the absence of slender ones. Probably the Lochbuy men are above the average stature of the island. The ancient family of MacLaine has for centuries been remarkable for loftiness of stature, that of the son of the present representative (included in the return) being no less than 6 ft. 5¾ in. I allow 1 inch and 12 lbs. for shoes and clothing. Probably the heads are large, Mr. MacPhail's measurements averaging 23½ inches.

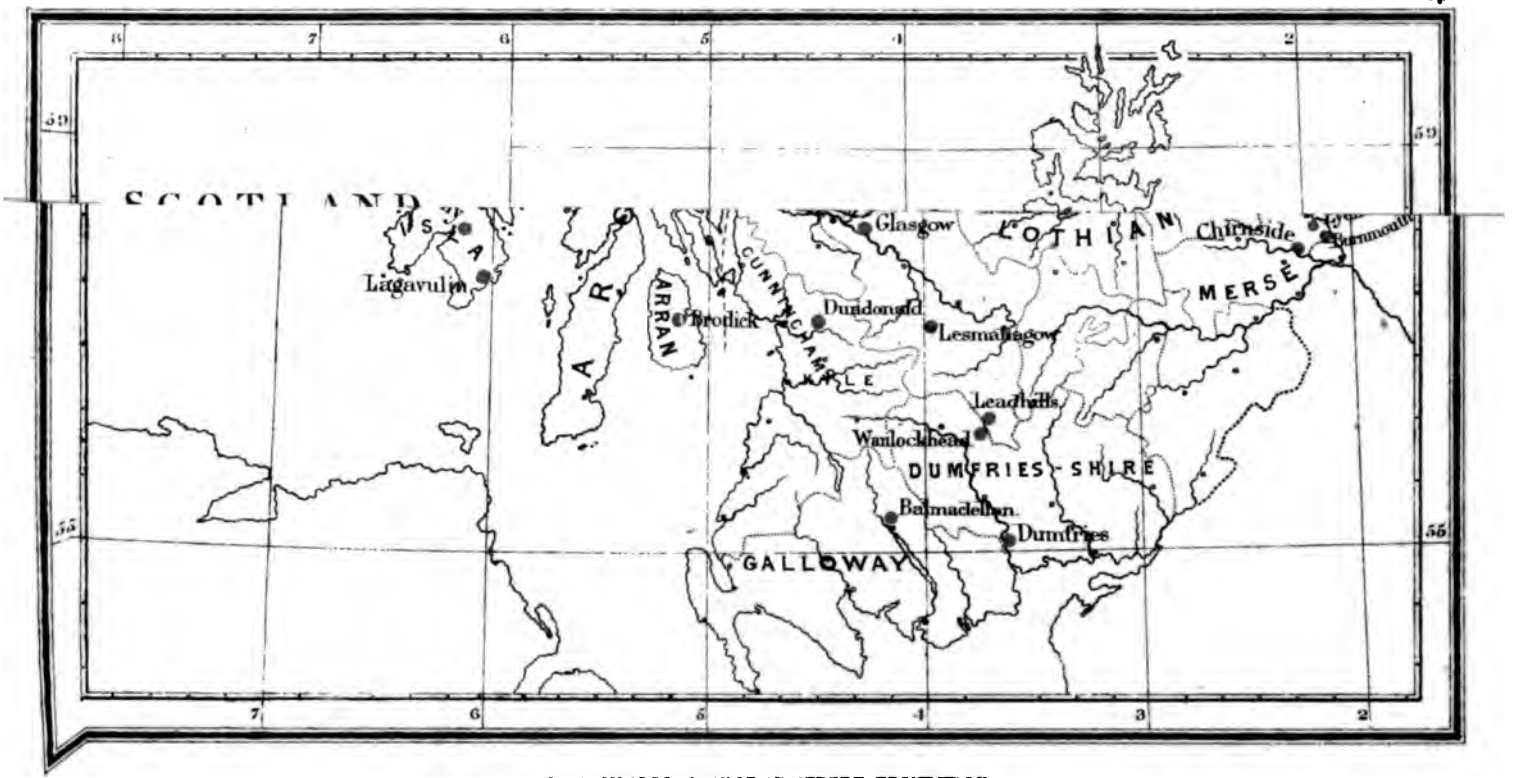
Blue Eyes, with some light grey	17	Red 1	Fair 7	Brown 6	Black (very dark?) 2	Coal black 1
Dark Grey	3	1†		2		
Brown or Black	10			4	3	3
Total	30	2	7	12	5	4

The men with blue eyes and black hair are the biggest; the red-haired men, and those with black eyes and hair, are small. The race in Mull, as in the Inner Hebrides generally, is supposed to be Scoto-Keltic, more or less crossed with Norse blood.

12. I owe this return, as well as the two next following, to Mr. Hector MacLean, F.A.S.L., Ballygrant, Islay. His report contains a number of interesting particulars; ·9 inch and 11 lbs. allowed. Of 27, the eyes were blue in 6; blue-grey, 2; light grey, 3; grey, 4; green-grey, 7; dark grey, 1; dark yellow-grey, 1; hazel, 2; dark brown, 1. Of 28, the hair was light red in 5; bright red, 1; flaxen, 2; flaxen-yellow, 1;

* Mr. Campbell (the author of the *Tales and Traditions of the Western Islands*) confirms this in a letter to me.
† Freckle-faced Highland type, which my friend Dr. Mitchell, I believe, calls Caledonian.

No	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
13.	Islay (Parish of Kilmeny)	Mixed rural population	48	5 8·37		171	1·7147	72·57
14.	Islay (Lagavulin, Parish of Kildalton)	Do., do., including also the staff of a distillery	18	5 8·21		167·5	1·7106	70·98
15.	Canisbay (Caithness) and the islands in the Pentland Firth	Mixed, but mostly fishermen and pilots	18	5 8·66		168·8	1·7220?	71·56
16.	Parishes of Dunnet, Olrig, Bower, Watten, Thurso, and Wick (Caithness)	Farm labourers and quarrymen	10	5 8·70		166·7	1·7218	70·84



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yellow-brown, 4; brown, 2; dark brown, 7; brown-black, 6. (See *Cran. Brit.*, cap. vii, p. 209.) Mr. MacLean believes the Colonsay-men to be to a great extent of Norse blood, more so than those of Islay, and much more than those of most of the other Hebrides.

13, 14. These two returns also are by Mr. Hector MacLean, for my introduction to whom I was indebted to Mr. Campbell, of Islay. (See *Cran. Brit.*, p. 209; and Mr. MacLean's own paper "On the Comparative Anthropology of Scotland," *Anthr. Rev.* for 1866, p. 209.) I allow ·9 inch and 11 lbs. for shoes and clothing. Both heights and weights are more exact in the Lagavulin return.

Colours in 88.

Hair ..... Red	Fair	Brown	Dark Brown	Black	Total
Eyes, Blue or Grey 5	16	16	17	6	60
Dark Grey or Neutral ... 1	1	3	7	7	19
Hazel or Brown		3	3	3	9
Total..... 6	17	22	27	16	88

Auburn is here included under red, yellow under fair, chestnut under brown, and brown-black under black. The black-haired men are considerably shorter than the rest; on the average of MacLean's measurements, their heads are narrower, and the circumference of their pelves, both absolutely and in relation to that of their shoulders, is smaller.

15. Mr. Kennedy, of Canisbay, procured this return, at the instance of the Earl of Caithness. Both heights and weights, especially the latter, are but approximate; and as I cannot ascertain whether the men had shoes on or otherwise, I have assumed that they had. I regret that I have no further information than is yielded by this and the next return respecting the Norse district in Caithness, which is ethnographically one of the most interesting portions of Scotland, and breeds a remarkably fine race of men.

16. This return is a portion of Mr. Edgar's.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
17.	Gaelic parishes in Caithness (Reay, Halkirk, and Latheron)	Quarrymen, stone sawyers, and labourers employed about the pavement works of the late Sir G. Sinclair, of Ulbster, at Forss, near Thurso	24	5 8·99		166·4	1·7282	70·71
18.	Sutherland county	Various: some quarrymen	7	5 9·64		166·4	1·7470	70·48
19.	Lochalsh, Wester Ross	Native population of a Highland district, chiefly fishermen, shepherds, etc., and all of local descent	21		5 7·92	173·3	1·7262	73·16
20.	Lochalsh	Ditto, persons who happened to call at a workshop near Dr. Duncan's house: all natives of local descent	20	5 9·50		168·0	1·7409	70·75
21.	Ross generally	Miscellaneous, from several reports: several lunatic attendants (rather a superior class in physique) included	18	5 9·59		166·1	1·7460	70·35
22.	Inverness town	Miscellaneous, being all the people who entered a shop in	15	5 7·78		153·8	1·7023	65·22

No.	REMARKS.

17. By Mr. James Edgar, manager at Forss, for Sir G. Sinclair, of Ulbster. Both measurements and weights are very minute and exact. I allow ·95 inch and 10½ lbs. for shoes and clothes, the latter by Mr. Edgar's direction.

		Red	Fair	Brown	Dark	Black
Colour of Hair in Norse Parishes	16	4	5	2	3	2
Gaelic Parishes	29	8	4	1	9	7
Total	45	12	9	3	12	9

Observe the greater frequency of fair hair, and rarity of black, in the Norse parishes; though the family names show that intermigration has been extensive.

18. Mostly from Mr. Edgar's report. ·9 inch and 11 lbs.

19 20 This and the next report are by Dr. George Duncan, of Conchra, Lochalsh; they are a fair sample, and the weights, etc., minutely correct. The Lochalsh Highlanders, among whom the MacRaes predominate, are generally reputed a stalwart race. Their food is oatmeal, milk, fish, and potatoes. Those in the second report were measured in their shoes. Dr. Duncan found the weight of clothing 12 lbs., and the height of heels 1½ inch; but probably an allowance of 1 inch would be sufficient. Of 46, the hair was red in 2; fair, 7; light brown, 4; brown, 11; dark brown, 6; black, 16. As a rule, the fair and brown-haired men surpassed the black in stature and weight, but were again exceeded by the dark brown.

21. ·9 inch and 11 lbs. allowed for shoes and clothing.

22 This is a portion of a return (containing 50 names) procured for me, in the manner stated, by Mr. Allan Macdonald, Inverness, at the instance of Dr. T. Aitken. ·8 inch and 10 lbs. allowed. There is some admixture of foreign (Lowland) blood in the town, but not very much.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
		Inverness during a certain period						
23.	Inverness county	Do. do.	10	5 9·60		182	1·7434	77·10
24.	Inverness county	Attendants in a lunatic asylum	15		5 8·33	169·6	1·7366	71·66
25.	Castleton of Braemar	General population of a mainly pastoral district: all natives of the parish	27	5 9·36		161·6	1·7373	67.58
26.	Kenmore, Perthshire Highlands	Rural population, all classes	33		5 9·27	175·2	1·7046	73.93

No.	REMARKS.

23 From the same return, 1 inch and 12 lbs. allowed. The superiority of the countrymen in stature and weight is striking, though Inverness is but a small town.

24. Dr. T. Aitken, F.A.S.L., Member of the Anthropological Society of Paris, Superintendent of the Inverness Asylum; 11·6 lbs. for clothes. In these returns from Inverness-shire, the fair and brown-haired surpass the dark and black-haired in stature, but fall below them in weight. And among the lunatics from this country (see Dr. Aitken's report), the dark and black men are again the shorter. There is a notable prevalence of grey eyes in all these returns: 11 blue, 17 grey, 3 dark grey, 9 brown or dark eyes. Hair: 14 fair, 12 brown, 11 dark brown, 5 black. The fair must include some reds.

25. I owe this return to Dr. W. Marshall, of Braemar, through Sir W. Jenner. From the manner in which it was compiled, it must be a perfectly fair sample, and the measurements and weights are very exact. I allow 1 inch and 12·6 lbs. for shoes and clothes.

Hair	Red	Very Fair	Fair	Brown	Black	Total
Eyes, Blue	1		6	1	1	9
Grey		1	3		3	7
Brown, etc.	3		3		4	 10
Total	4	1	12	1	8	 26

The black-haired men are tallest and largest, especially those with light eyes. For "fair", I should probably have said "brown". The proportion of brown eyes is large for a Gaelic community; compare, in this and other points, the return (No. 26) from Kenmore. A number of Lowland names, borne mostly by the fairer men, testify admixture of blood. Oatmeal is the chief food, but animal food is pretty largely used. The district is one of the most elevated in the kingdom, the village being about 1,100 feet above the sea.

26. Mr. W. Armstrong, Kenmore, who favoured me with this return, took first a number of what he considered average men, and then, at my request, added a few extreme specimens. Omitting one small-framed

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
		Inverness during a certain period						
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Hair	Red	Very Fair	Fair	Brown	Black	Total
Eyes, Blue	1		6	1	1	9
Grey		1	3		3	7
Brown, etc.	3		3		4	 10
Total.....	4	1	12	1	8	 26

The black-haired men are tallest and largest, especially those with light eyes. For "fair", I should probably have said "brown". The proportion of brown eyes is large for a Gaelic community; compare, in this and other points, the return (No. 26) from Kenmore. A number of Lowland names, borne mostly by the fairer men, testify admixture of blood. Oatmeal is the chief food, but animal food is pretty largely used. The district is one of the most elevated in the kingdom, the village being about 1,100 feet above the sea.

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No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
27.	Ballachulish, Argyle	Mostly slate quarriers	24	5 8·86		162·6	1·7246	68·73
28.	Argyleshire	Miscellaneous, from several reports	14	5 8·10		169·9	1·7104	72·11
29.	Arran	Mixed: chiefly fishers, farmers, and labourers	23	5 9·40		167·2	1·7384	70·39

family, the men range from 5 ft. 6 ins. to 6 ft. 3 ins.; the sample is, therefore, probably not far from a fair one. I have myself remarked the "magni artus" and "rutilæ comæ" of the men of this district, who probably represent the Caledonii of Tacitus. 12·2 lbs. allowed for clothes.

	Red	Fair	Brown or Dark	Black	Total
Eyes, Blue or Grey	9	6		6	21
Dark Grey			2		 2
Hazel, Brown.....	2	2	3	3	10
Total	11	8	5	9	33

I think the "fair" here corresponds nearly to what I call medium brown (French *chatain*). Under red I have put "auburn" and "sandy." Those with dark hair, and especially those with grey eyes and black hair, are the tallest men; the red are bulkiest; the fair generally smaller.

27. By Donald MacRaild, Esq., M.R.C.S., Ballachulish, through Professor Cowan. Heights pretty exact; weights in many cases rough or conjectural. I have allowed 1 inch and 11 lbs. for shoes and clothing. The names indicate no admixture of Lowland blood, though the colour of the eyes is suspicious; but hazel eyes are not unfrequent in the sandy-haired freckle-faced Highland type, which my friend Dr. Mitchell, I believe, calls Caledonian. In 23

Hair	Red	Fair	Brown	Dark Brown	Black
Eyes, Blue or Light-Grey...13.....	3	2	2	4	2
Hazel, Light-Brown.....2.....		2			
Brown .....8.....	1		5		2

28. ·8 inch and 10·9 lbs. allowed for shoes and clothes. Two very heavy men exalt the weight unduly.

29. Mr. W. Halliday, Brodick, Arran, who thinks the sample fair. The heights vary from 4 ft. 10 ins. up to 6 ft. 5 ins. The island is still Gaelic, and I believe there has not been much immigration of late years,

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
30.	Boyndie, Banffshire	8 fishermen, and 9 farmers and other landsmen	17	5 8·76		169·9	1·7257	71·21
31.	Crimond, Buchan, Aberdeenshire	Rural population, all classes, natives of Buchan	27	5 9·03		164·6	1·7315	69·39
32.	Rathen, Buchan, Aberdeenshire	Fishermen	19	5 7·31		150·6	1·6901	63·50
33.	Aberdeenshire in general	Miscellaneous, from other reports	18	5 8·83		169·6	1·7282	71·93
34.	Counties of Angus and Kincardine	Mostly attendants, artisans, etc., employed at Montrose Lunatic Asylum	22		5 6·44	158·8	1·6886	67·49

No.	REMARKS.
	but the names are in great part Lowland. I have allowed 1 inch and 12 lbs. for shoes and clothes. The eyes are mostly grey; the hair in 1 red, 7 fair, 3 brown, 3 dark, and 9 black. "Some of these may not be coal-black," says Mr. Halliday, "but most of the natives are either very red or very black."
30.	This return was sent to Dr. Barnard Davis by Mr. Milne. I have allowed ·86 inch and 12·9 lbs. for clothes and shoes. The fishermen are, on the average, shorter and lighter than the landsmen, and their heads are rather smaller; the average circumference of 11 heads is 22·35 only.
31.	From Dr. W. Bruce, of Crimond. ·9 inch and 11·6 lbs. allowed. This has every appearance of being a fair sample of the population of Buchan, which is a peculiar district, with a very pure race.

Hair	Fair.	Brown.	Dark.	Black.	Total.
Eyes...Blue or Light Grey ...	10	2	5		17
„ Dark Grey.....	1	1	1	1	 4
„ Brown	2	1	2	1	 6
Total	13	4	8	2	27

The black-haired men are small.

32.	Procured by Mr. MacConachie for Dr. William Bruce. The men were measured and weighed at a railway station, as they happened to pass. I allow ·8 inch and 10·6 lbs. for shoes and clothing, as they do not seem to have been in their fishing clothes.
33.	Several of the men were attendants in lunatic asylums: the sample may perhaps, therefore, be above the mark, though I doubt it. ·83 inch and 11 lbs. allowed.
34.	Mostly from Dr. J. Howden, Med. Supt. of the Montrose Royal Asylum. 10 lbs. allowed for clothing.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
35.	Arbroath	Upper or middle-class natives of town and neighbourhood	8	5 10·40		169·1	1·7689	71·70
36.	Arbroath	Artisans and labourers, natives of town and neighbourhood	16		5 7·36	157·0	1·7119	66·67
37.	Dundee and rest of Angus	Mixed classes, natives of all parts of the county, living in Dundee	15	5 9·73		171·8	1·7492	73·12
38.	Aberdeenshire, Banffshire, Angus, and Mearns (excluding only Braemar)	Total	142	5 8·74		162·6	1·7256	69·84
39.	Perthshire in general	Miscellaneous, from various reports, but includes a good many lunatic atendants	22	5 9·45		169·2	1·7434	71·66
40.	Pitteadie, near Kirkcaldy, Fife	Agricultural: ploughmen, farm-servants, and workmen employed on the land of G. Prentice, Esq., with a few members of his family	36	5 9·43		165·9	1·7391	69·80

No.	REMARKS.
35 } 36 }	From Dr. Andrew Key, of Arbroath, to whom I owe both these reports, and much information as to the people. ·8 inch and 11 lbs. allowed in the first, and 10 lbs. in the second report.
37.	From John Davidson, Esq., F.A.S.L., Dundee, whose return embraced a number of other men. ·9 inch and 10·8 lbs. allowed.
38.	·83 inch allowed for shoes and 10·8 lbs. for clothing. Probably a fair representation of the population of these counties, excluding the lowest stratum of that of the great towns, Aberdeen and Dundee.
39.	Nearly half are from a report by Dr. C. Macintosh, M. Sup. of the Perth District Asylum, Murthly; I allow ·85 inch and 11·2 lbs. The average is high, possibly too high, but tall stature is certainly the rule in Perthshire. Most of the people measured were born in Lowland parishes, but about half bore Highland names. The eyes are marked as blue and grey, *with only one exception*, and the hair as fair or brown, with only three.
40.	Robert Prentice, Esq., of Strathore, favoured me with these observations, which ought to yield a fair sample of the agricultural population of Mid Fife. The weights are exact; the heights not generally carried beyond inches. I allow 1 inch for shoes and 12 lbs. for clothing.

		With Red Hair	Lt. Brown	Brown	Dk. Brown	Black
Blue Eyes	17	—	9	3	3	2
Grey „	10	—	2	—	4	4
Brown or Black	9	1	—	3	1	4
Total	36	1	11	6	8	10

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight.	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
41.	Kirkcaldy and neighbourhood	A fair sample of the Artillery Volunteers, mostly artisans, and natives of Kirkcaldy and other towns in Fife	26	5 9·18		157·7	1·734	66·67
42.	Buckhaven, Fife	Fisher-folk	4	5 7·87		160·2	1·7028	67·58
43.	Dunfermline	Townsmen, natives of Dunfermline, of various occupations, taken indiscriminately	10	5 9·31		151·4	1·7409	63·95
44.	Fife in general	A mixture of all classes, born in Mid and West Fife, and	19	5 8·61		162.2	1·7231	68·71

Probably, according to my own scale, some of Mr. Prentice's light browns would be brown, and some of his blacks dark brown or brownish black. The 17 fair and brown-haired men average nearly 2 inches above the black and dark brown. The Fife people are very generally fair. In the east of the county, the physical and moral characteristics are supposed to point to a strong infusion of Scandinavian and Anglian blood, introduced by gradual and probably peaceful immigration; this infusion visibly decreases as one proceeds westward.

41. By Dr. James Dewar, of Kirkcaldy. Heights and weights very exact. I allow ·9 inch and 10·7 lbs. for shoes and clothes.

	With Red Hair		Lt. Brown	Brown	Dk. Brown	Black
Blue or Grey Eyes.....	11	1	4	3	2	1
Hazel Eyes.....	9	—	2	2	5	—
Brown or Black Eyes	6	—	1	1	2	2
Total.....	26	1	7	6	9	3

No particular relation between stature and complexion. Dr. Dewar's hazel eyes are probably what I should call hazel grey or neutral.

42. From another return by Dr. James Dewar, of Kirkcaldy. Buckhaven contains a very pure-blooded community of fishermen, some, at least, of whose ancestors are said to have been of Dutch or other Easterling extraction. Colour of hair, etc., see "Cont. to Sc. Ethnol.," by the author. I allow ·87 inch and 11·2 lbs. for shoes and clothes.

43. Dr. Andrew Dewar, junr., of Dunfermline. I allow ·81 inch and 10·4 lbs. for shoes and clothes. In 21 Fifemen, mostly from the western part of the country, including the foregoing. Dr. A. Dewar finds 4 with fair, 7 with brown, 8 with dark, and 2 with black hair.

44. Drs. James and Andrew Dewar, Sir Duncan Gibb, Bart., M.D., and other friends. ·81 inch and 10·7 lbs. allowed for shoes and clothes. Hair in 1 Red; 5 Fair; 5 Brown; 6 Dark; 2 Black. No such difference between the fair and dark men as in the first Fife return.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
		living mostly in towns (Kirkcaldy, Dunfermline, Inverness, London, and Bristol)						
45.	Fife, average of returns		95	5 9·12		161·1	1·7338	68·08
46.	Glasgow and Edinburgh	Miscellaneous, from various returns : includes several of the upper class	26	5 7·98		149·5	1·7073	63·27
47.	Glasgow	Patients at Glasgow Infirmary, with slight ailments, mostly artisans	21	5 6·63		136·8	1·6774	58·05
48.	Other parts of Scotland	Patients as above	19	5 7·35		137·6	1·6852	58·41
49.	Dundonald, near Kilmarnock and neighbourhood	General population of a rural district, all born in Ayrshire	20	5 10·35		167·3	1·7625	70·43
50.	Dundonald, second table as finally revised	Ditto, ditto	48	5 10·53		169·0	1·7671	71·21

No.	REMARKS.
45.	·9 inch and 11 lbs. allowed.
46.	Half of these were from reports by Dr. James D. Maclaren, Physician to the Glasgow Royal Infirmary. ·8 inch and 10 lbs. allowed.
47.	Also by Dr. Maclaren. The men in this second return were suffering from slight ailments only, and not much reduced by disease; nevertheless, Dr. M. remarks, "they were hardly a fair sample of the artisan population, being mostly rather underfed and overdrunk. I allow ·63 inch and 8·8 lbs. for shoes and clothes.
48.	Also by Dr. Maclaren, and of the same class. ·65 inch and 8·8 lbs. allowed for shoes and clothes. The difference in height is much in favour of these latter men, who were mostly country-born. There seems to have been a little difference in colour; also, of 27 town-born men, 12 only had dark hair; of 26 country-born men, 15; but of the former, 10, and of the latter, only 7, had dark eyes.*
49.	This and the following return are by Dr. W. Alexander, of Dundonald. The first was taken haphazard, and Dr. Alexander thought it a fair sample, but at my request, in order to test its correctness, he was so obliging as to collect the materials of the second table, which contains all the males, of suitable age, within a certain radius of his dwelling.
50.	This may be looked upon as a perfectly unexceptionable sample. The largest and one of the tallest men I excluded, one for excessive corpulence, the other from doubts about his nativity; otherwise the averages would have been 5 10·67 and 171·4. I also excluded some who had appeared in the first return, and who

* See my paper on "Permanence of Anthropological Type," in vol. II of these *Memoirs*.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
	Ditto, ditto, before revision	Ditto, ditto	53	5 10·82		172·5	1·7744	72·79
		Natives of towns in Ayrshire, included above	13	5 9·19		173·1	1·7330	73·07
		Ditto of rural parishes	57	5 11·17		169·6	1·7833	71·48
51.	Lesmahagow, West Lanarkshire	General population of a mainly rural district, mostly farmers and labourers, with a few miners and shopkeepers	67	5 9·85		168·9	1·7498	70·75

would have raised the average to the figures last given in the margin. 1 inch and 12 lbs. allowed for shoes and clothes. Colours of eyes and hair in 70.

	Fair, etc.	Brown	Dark	Black	Total
Blue Eyes (many dark blue)...	13	10	15	2	40
Grey	—	2	3	—	5
Hazel or Brown	—	3	5	—	8
Black	—	—	7	10	17
Total	13	15	30	12	70

Those with blue eyes and fair hair, and those with grey eyes, are much taller, as a rule, than the rest, and somewhat heavier. The country-born men average 2 inches more than the town-born.

The district of Kyle, in the northern part of which Dundonald is situated, was conquered from the Strathclyde-Welshmen by the Northumbrian Angles, when in the plenitude of their power; and the eleventh and twelfth centuries, no doubt, brought in some Northumbrian and Anglo-Norman settlers, but the blood must be still mainly British. The same tall stature, with generally blue or grey eyes and dark hair, prevail here, as in the other ethnologically similar districts of Lesmahagow and Balmaclellan.

51. By E. R. Alston, Esq., of Stockbriggs, near Lesmahagow, to whose assistance I also owe the returns from Arran, Kenmore, and South Uist. The sample is a perfectly fair one, the men having been taken just as they were met with. I allow 1 inch (by Mr. Alston's direction) for shoes, and 12·0 lbs. for clothes. The weight is, in most cases, only an approximation, but is, in his opinion, reliable; and comparison with the exact weights, gotten where it was practicable, seems to bear him out.

	Hair Red	Fair or Lt. Brown	Brown or Dk. Brown	Black	Total.
Eyes Blue	2	13	9	6	30
„ Grey.....	—	6	8	7	21
„ Brown, etc....	—	—	5	10	15
Total	2	19	22	23	66

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
52.	Wanlockhead, Dumfriesshire, most elevated village in Great Britain	All the leadminers in the village, constituting, with two exceptions, the entire native population of fit age for the purpose	92	5 9·43		163·9	1·7391	68·94
53.	Leadhills	All leadminers	25	5 8·65		152	1·7193	63·72

The tallest men are those with grey eyes and dark brown hair, and the fair-haired men are decidedly short.

Red hair is very rare in this district, and coal-black very common, though in childhood the hair is usually fair. Aquiline noses prevail. Morally, these people have, I believe, the shrewd, canny, "theological" character which belongs to the Western Lowlands of Scotland generally. The race is probably the old Cambro-British, but little crossed. See the returns from Wanlockhead and from Upper Galloway.

The 28 farmers and farmers' sons included in this return, averaged 5 10·21 and 171 lbs.

52. W. Watson, Esq., surgeon in Wanlockhead, compiled this report, which is, in some respects, the most interesting in my collection. The village of Wanlockhead is perched high among the misty Lowther Hills, near the head of the Clyde, and about 1,500 feet above the sea. Cherries ripen there in favourable seasons. I allow 1 inch and 11·9 lbs. for shoes and clothes.

Eyes: 2 Light Blue, 45 Blue, 2 Dark Blue, 25 Grey, 3 Dark Grey, 6 Brown, 6 Dark Brown, 3 Black.

Hair: 1 Light Red, 1 Red, 3 Dark Red, 3 Yellow, 19 Light or Fair, 4 Light Brown, 9 Brown, 21 Dark Brown, 17 Dark, 2 Brown-Black, 12 Black.

This distribution of colours much resembles that found by Mr. Alston, at Lesmahagow, which is the same range of mountains, but lower, and further to the north-west. 38, or 41 per cent., exhibit the combination of blue or grey eyes with black or dark hair, which I have been accustomed to call Keltic. There is no very notable relation between the variations of height and of colour. The extremes of height (in shoes) are 5 feet 5 inches and 6 feet 1½ inch; six, at most, would have been below the military standard of 5 feet 5 inches.

53. Procured for me by Mr. Watson: the measurements, etc., taken by Mr. J. F. Neven,—1 inch and 11½ lbs. allowed for shoes and clothes. Leadhills is situated very near to Wanlockhead, at a somewhat lower elevation. This is only a sample of the mining population; but it seems to indicate a considerable inferiority of size in them, as compared with those of Wanlockhead. 18 of the 25 have blue or grey eyes,

No	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
54.	Glenkens district, Upper Galloway	Pastoral and agricultural population of all grades, taken indiscriminately, as they were met with, only excluding those alien to the neighbourhood by birth or pedigree. 119 were measured, but 44 are excluded here, as over or under the prescribed age	75	5 10·46		173·58	1·7907	72·38

4 dark grey or intermediate, and only 3 brown. There is still the same prevalence of the combination of blue or grey eyes with dark or black hair; it occurs here in 8 persons.

These mountains are in the heart of the ancient Strathclyde-Welsh country, and doubtless the basis of the race is Cumbrian. The family names are mostly of the ordinary Lowland-Scotch type, with a few from the borders and a few from the Gallovidian clans.

These people are poor, but hardworking, frugal, and intelligent; they have very little animal food, but have a good village library.

54. This very valuable return I owe to the Rev. Geo. Murray, of Balmaclellan, Upper Galloway, through the introduction of Dr. Arthur Mitchell. The sample is a perfectly fair one, including a great part of the population of a thinly-peopled district. The measurements and weights were taken with great accuracy and minuteness. 14 lbs. allowed for clothing, by Mr. Murray's direction.

		With Red Hair	Fair	Brown	Dk. Brown	Black
Blue Eyes	36	2	15	6	11	2
Grey Eyes.....	19	1	6	5	3*	4
Brown, etc., Eyes	20	—	2	4	6	8
Total	75	3	23	15	20	14

The averages of 28 farmers, and others of the upper and middle class, are 5 11·33 and 178·5; of 15 ploughmen, and the like, 5 10·4 and 177·4; of 12 shepherds, 5 9·65 and 165·9; of 10 smiths, masons, and joiners, 5 9·04 and 167·15; of 6 tailors and shoemakers, 5 10·1 and 162·3. The 14 black-haired men average 5 11·27 and 171·6; thus presenting the extreme of the local character of tall stature and comparatively moderate weight; 20 dark-brown haired, 5 11·06 and 180·5; 15 brown-haired, 5 9·2 and 170·13; 23 fair-haired, 5 10·3 and 174·7. The dark-eyed men also exceed the blue and grey-eyed, generally speaking.

* One of these had dark grey eyes.

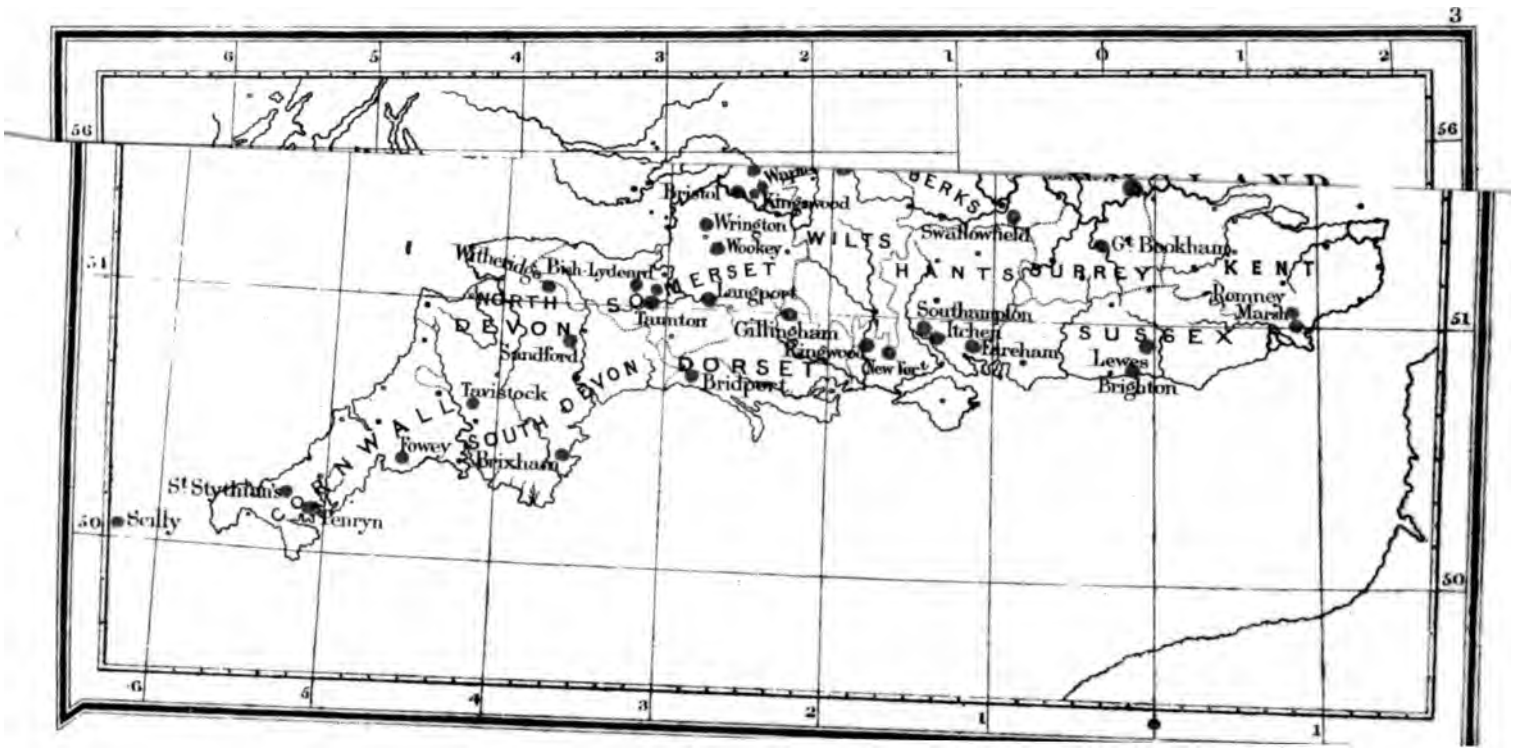
No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
55.	Dumfries	Attendants and other (sane) persons employed in and about two large lunatic asylums: all natives of the parish of Dumfries	22	7 7·20		161·1	1·6875	68·30
56.	Dumfriesshire	Miscellaneous, from different returns	15	5 9·22		163·5	1·7363	69·16
57.	Chirnside (Berwickshire) and neighbourhood	Farmers and peasants of local descent	25	5 11·28		199·68	1·7861	84·21

No.	REMARKS.
	All the men are of Gallovidian extraction, more or less pure. The original population has been Strathclydian or Gallovidian; but what immigration has occurred during the last few generations has probably been from the south-east. Celtic patronymics, such as McCulloch, abound: I should estimate them at a half. Mr. Murray says the population is well fed and well clothed; the children live chiefly on oatmeal porridge and milk, and are not put early to hard work.
55.	I owe this return to Dr. Gilchrist, Medical Superintendent of the Crichton Institution and the Southern Counties Asylum. Both weights and measures are exact to a small fraction. ·8 inch and 10½ lbs. allowed.
56.	·9 inch and 11lbs. allowed for clothes and shoes. In Dumfriesshire, or at least in its southern, eastern, and central districts, the local and family names, and the history, too, so far as known, as well as the physical type, indicate a very large infusion of Norse, and probably even of Anglian, blood. In Eskdale, I think, the Norse element preponderates.
57.	By Dr. Charles Stuart, of Chirnside. I allow 1 inch and 14 lbs. for shoes and clothes. The measurements are not carried beyond inches and half-stones (7 lbs.). The colours are very different from those in the west of Scotland, under nearly the same parallel; the eyes being marked as blue in 17, grey in 5, and dark in 3; the hair as fair (light shades of brown chiefly) in 19, and dark in only 6.
	The tall stature and huge frames of the men of the Merse, strike every visitor to the Borders. As represented in this return, they surpass, in the latter respect, those of every other district in Britain. My friend, Dr. Stuart, told me, that in this and the next schedule he exhausted all the pure-blooded Borderers he could meet with in his district, and that he thought there were hardly any small men among the unmixed natives.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
58.	Chirnside, etc.	Rural population	15	5 9·45		?	1·7396	?
59.	Burnmouth, fishing village, Berwickshire	All fishermen	8	5 9·0		168·6	1·7333	71·02
60.	Eyemouth, fishing town, Berwickshire	Mostly fishermen	9		5 7.73	176·3	1·7213	74·52
61.	The Eastern and Middle Marches, and Lothian	Miscellaneous, from several returns	16	5 9·40		165·9	1.7409	70·26
62.	Scotland in general	Miscellaneous, from several returns	28	5 9·60		160·7	1·7460	68·03

No.	REMARKS.
	Ethnologically, the Merse (or low-country of Berwickshire) is a Teutonic district, differing little from East Northumberland.
58.	Procured by Dr. Stuart, at my request, for Dr. Barnard Davis. I believe in this return Dr. S. was not so particular about the descent. Several persons appear in both returns; if these two returns are fused together, the average stature (with shoes) will be 5 10·56. The climate of Berwickshire is harsh and inclement; the food of the present generation of labourers used to be chiefly oatmeal, pease-bannocks, and milk.
59.	This return again is by Dr. Charles Stuart. Some of the weights not quite exact, but the average, if these were excluded, would be higher. I allow ·8 for shoes and 12 lbs. for clothes. The Burnmouthers intermarry much among themselves; but they are a handsome, healthy, well-developed people; they vary much in complexion. See Dr. Arthur Mitchell on "Consanguinity" (*Edin. Med. Journal*, No. 118, p. 910) for an account of the Burnmouthers.
60.	By Dr. Forsyth, of Eyemouth. Both measurements and weights are rather roundly taken. I believe the men were without shoes, but I allow 12 lbs. for clothes. The Eyemouth fishermen are a handsome and stalwart race, with, for the most part, light complexions and hair. I should think this sample rather inferior to the average in height, as Dr. Forsyth found the mean of 11 old men and lads to be as high as 5 8·55.
61.	·9 inch and 11 lbs. allowed. Average of 30 Eastlothian reapers, 5 feet 9 inches and 159 lbs. (Johnston's Physical Atlas).
62.	·9 inch and 10.7 lbs. allowed. Mostly from Galloway or the Midland counties, or born in some part of Scotland not specified; several lunatic attendants included, and several members of the upper and middle class.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
63.	Berwick-upon-Tweed	Berwick Volunteer Riflemen. Occupations various, but mostly artizans	20		5 8·25	152·2	1·7345	64·67
64.	Wooler, North Northumberland	Inhabitants of a small town, of pure local descent	20	5 8·7		162·5	1·7256	68·94
65.	North part of Northumberland, including Morpeth, Alnwick, Rothbury, Belford, etc.	The Percy Artillery Volunteer Corps, who were all measured, but only 290 came within the prescribed limits of age. All classes and occupations	270		5 8·77	163·57	1·7477	69·39
66.	Boulmer (fishing village), near Alnwick	Fishermen, in the above Corps	20		5 9·06	172·5	1·7551	72·57
67.	Belford, Wooler, Chatton, all in Northumberland	The 4th Northumberland (Belford) Rifle Volunteers. Occupations various, but mostly village artizans	40		5 9·61	162·5	1·7691	69·17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Bristol
Wells
Kingswood
Wrington
Wookey
Withycombe
Bish-lydeard
Taunton
Langport
Gillingham
Ringwood
New for.t
Bridport
Tavistock
Tawey
Brixham
St Stythians
Scilly
Penryn
Swallowfield
Southampton
Itchen
Fareham
Lewes
Brighton
Romney
Marsh
G.t Bookham
BERKS
WILTS
HANTS
SURREY
KENT
SUSSEX
SOMERSET
NORTH DEVON
SOUTH DEVON
DORSET
CORNWALL

No.	REMARKS.
63.	Mr. Tate, of Alnwick, procured this return for me from Captain Douglas. The average weight of clothing was 9 lbs. 10 ozs. Colours as follows :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	—	5	5	3	—	13
„ Brown, etc.	3	1	1	1	1	7
Total	3	6	6	4	1	20

Most of the surnames are English, or at least not distinctly Scotch.

64. Measured for me by my friend, since deceased, Dr. W. Alexander, of Wooler. (See *Crania Britannica*, vii, 216.) ·8 inch and 10·5 lbs. allowed.

65. I owe this return (and all those from Northumberland, except Wooler and Allenheads), to George Tate, Esq., of Alnwick, F.G.S., Hon. Sec. of the Berwickshire Naturalists' Club, who procured these particulars from Major Holland. The measurements seldom go beyond inches, but the weights, in most of the districts, are more exact. 10·57 lbs. allowed. The colours of eyes and hair are given; but the several observers manifestly disagree in their system of nomenclature. On the whole, however, it is clear that hazel or brown eyes are pretty common, and that the hair is usually brown rather than either very fair or dark.

66. 12·5 lbs. allowed. I have selected these fishermen for a separate item, as Boulmer is so small a village (it contained only 150 people in 1851), that we must have here almost, if not quite, every native fisherman in the place, and the average must nearly represent that of the community. With two exceptions, all had blue or grey eyes, and with five exceptions were named Stephenson, Stanton, or Stewart.

67. Procured for me by Mr. Tate from Sergeant-Major Treble. 10 lbs. allowed for clothing. 22 blue, 7 grey, 6 hazel, 4 brown eyes. About 11 bear surnames apparently Scotch.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
68.	Alnwick and neighbourhood	5th Northumberland (Alnwick) Rifles. All classes	20		5 9·42	161·0	1·7643	68·59
69.	Morpeth and neighbourhood	Morpeth Rifles. All classes except labourers	15	5 9·46		172·8	1·7434	73·47
		Farmers included in the above returns from Volunteer Corps	27		5 10·1	173·1	1·7816	73·47
70.	Newcastle-on-Tyne	Northumberland Light Infantry Militia (artizans and unskilled labourers)	294		5 6·20		1·6824	
	Gateshead	Ditto	11		5 6·57		1·6918	
	North Shields, Tynemouth, etc., and suburbs of Newcastle	Ditto	20		5 6·63		1·6934	
	Berwick and Tweedmouth	Ditto	21		5 7·00		1·7028	
	Morpeth and Alnwick (32), and rest of Northumberland (10)	Ditto	42		5 7·19		1·7076	
	Rest of England	Ditto	17		5 6·85		1·6990	
	Ireland	Ditto	21		5 6·88		1·6997	
	Scotland	Ditto	15		5 7·48		1·7187	

No.	REMARKS.
68.	By Mr. Tate, from Captain Browne. 10 lbs. allowed.
69.	By Mr. Tate also. 10·8 lbs. allowed, and ·86 in. for shoes. In 56 men of all ages, measured for this and the preceding return :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	3	12	15	5	3	38
„ Lt. Brown, Hazel, &c.	2	2	6	6	2	18
Total	5	14	21	11	5	56

I think Mr. Tate's classification would nearly agree with mine, except that I might call his "black" *very dark brown*. The eyes are well discriminated, as follows :—Blue, Light Blue 9, Dark Blue 8 ; Grey, Light Grey 20, Dark Grey 1 ; Light Brown 2, Hazel, Brown, etc., 16.

70. This return, including all the men in the regiment of fit age, is also due to Mr. Tate. I have divided it with reference to the birthplaces. The small size of the militiamen, especially the townsmen, as compared with the Northumberland volunteers, is the more noteworthy as there is a minimum standard of 5 feet 4 inches.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
71.	Allendale, South Northumberland	Lead miners living at elevations of from 800 to 1600 feet above the sea. A fair sample	25		5 8.57	159·3	1·7427	68.03
72.	Aspatria, Brayton, and neighbourhood (western part of plain country of Cumberland)	Rural population, chiefly labourers and village artizans	45	5 8·40		159.9	1·7155	67·58
73.	Westmoreland, Furness, and South Cumberland. Chiefly Millom (C.), and Stainmore (W.)	Clergymen, farmers, miners, and others	26	5 9·46		164·77	1·7409	69·62
74.	Ambleside, Grasmere, and neighbourhood, Westmoreland	Village population, chiefly stonewallers, carpenters, and painters	48	5 9·34		165·0	1·7434	70·30
75.	Cumberland and Westmoreland. All parts	Miscellaneous, from several reports	14	5 9·00		161·0	1·7333	68·26

No.	REMARKS.

71. Procured for me by T. Sopwith, Esq., F.R.S., from Mr. John Curry, Superintendent at Allenheads. 9·34 lbs. allowed. Colours in 24 :—

Hair	Red	Fair	Brown	Dark	Black (?)	Total
Eyes, Grey	1	1	7	2	5	16
„ Dark Grey	—	—	1	2	1	4
„ Brown	—	—	—	1	3	4
Total	1	1	8	5	9	24

Ethnographically, the diminution of the Teutonic race-element in this district, as compared with East Northumberland and West Cumberland, is accompanied, apparently, with darkening of the hair.

72. By William Lawson, Esq., of Brayton, Aspatria. The persons measured were in great part those employed on his land. ·9 inch and 10·9 lbs. allowed for shoes and clothing. Colours :—

Hair	Red	Fair	Brown	Dark, &c.	Total
Eyes, Light	3	6	12	6	27
„ Dark Grey	—	—	2	3	5
„ Brown, &c.	—	—	8	5	13
Total	3	6	22	14	45

73. By the Rev. J. Irving, of Millom, and afterwards of Stainmore. Heights mostly in inches; weights accurate. ·96 inch and 11·27 lbs. allowed. The Westmoreland men rather surpass the Cumberlanders in size.

74. By George Fothergill, Esq., and Mr. W. Garside, master painter, Ambleside. Measurements and weights very exact. A few men (7) barefooted. ·74 inch and 10 lbs. allowed.

75. ·8 inch and 10·5 lbs. allowed. Almost all fair men. These four reports should yield a tolerable average of the Cumbrian population, outside of Carlisle. The results are 5 feet 8·94 inches and 162·7 lbs., which I should have thought rather below than above the mark.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
76.	Haswell, Fence-Houses, Easington, and neighbourhood, in co. Durham	All coal-miners	51	5 7·38		152·4	1·6870	64·37
77.	County Durham in general	Almost all of the working-classes, especially fitters, founders, and other iron-workers	35	5 8·68		152·9	1·7244	64·83
78.	North Riding of York, especially Western Cleveland	Inhabitants of Middlesborough: a mixture of classes and occupations	20	5 8·88		157·8	1·7302	67·26
79.	Staithes, fishing village, near Whitby	Fishermen	6	5 10·16		166·2	1·7513	68·94
80.	Ormesby parish, Cleveland; mostly from Normanby township	Mixed rural and village population	20	5 9·30		166·3	1·7384	70·66
81.	Danby in Eskdale, and neighbourhood (Eastern	As the last: country artizans and labourers	16		5 9·25	161·7	1·7600	68·80

No.	REMARKS.
76.	By Dr. John E. Macdonald, of Haswell. A very accurate return, and a fair sample. Some men were weighed before going down, and others after coming up. I allow 1 inch for shoes and (by Dr. Macdonald's direction) 10½ lbs. for clothing.

COLOURS IN 52.

Hair	Red, etc.	Fair	Brown	Dark and Black	Total
Eyes, Blue, Grey, etc....	5	13	14	2	34
„ Brown	1	2	11	4	18
Total	6	15	25	6	52

Some of Dr. Macdonald's "Brown" I should probably call "Dark." The names yield little indication as to the admixture of race. Very few appear Scotch, and only 5 end in 'son.

77. 20 of these are from Mr. Ellerton's return of inhabitants of Middlesborough, and 5 from his Normanby return; the remaining 10 from various other schedules. All 3 divisions exhibit the same character of tall stature and light weight. ·83 in. and 10 lbs. allowed. 15 ironworkers average 5 ft. 8·17 ins. and 152·4 lbs.

78. Part of a careful return by John Ellerton, Esq., of Middlesborough, F.A.S.L. All reckoned as in shoes, for which ·8 inch allowed, and 9·5 lbs. for clothes.

79. Another portion of Mr. Ellerton's return. Measured and weighed in thick fishing boots. I have allowed 1·25 inch and 14·25 lbs.

80. A separate return by Mr. Ellerton, and also very exact. I allow ·9 inch and 10½ lbs.

81. By the Rev. J. C. Atkinson, incumbent of Danby, and author of the *Glossary of the Cleveland Dialect*. 10 lbs. allowed for clothing. Light eyes and dark hair seem to prevail.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
82.	Kirkdale (near Helmsley, in the Eastern Moorlands) and neighbourhood	Rural population: all classes and occupations	16	5 9·81		168·0	1·7511	71·21
83.	Malton, on border of East and North Ridings	Mixed town population: fair sample	15		5 7·81	157·8	1·7234	66·90
84.	Richmond and Gilling and neighbourhood, Swaledale, North Riding	Farmers, tradesmen, and artizans	30		5 10·01	170·7	1·7793	72·34
85.	East Riding; divers parts	All the males of fit age living on a farm on the Wolds near Bozeley	9		5 9·05	158·2	1·7549	67·81

No. REMARKS.

86. By Kelburne King, M.D., F.A.S.L., whose report included the whole Police Force of Hull. Heights accurate; weights rather loose. 11 lbs. allowed.

See above. 25 Lincolnshire men, in the same report, averaged 5 feet 9·60 inches and 169·3, and 15 Irishmen 5 feet 9 inches and 164·4.

There is a great preponderance of light and brown hair over dark shades in all these East Riding reports, whether from town or country.

87. From two small reports by Dr. Paley, of Ripon, and Dr. James Wood, of Kirkby Overblow, with additions. The Ripon men were mostly farm servants. ·9 inch and 10·2 lbs. allowed.

88. By J. W. Kaye, Esq., F.A.S.L., Bentham. ·9 inch and 12·16 lbs. allowed. A very accurate return, which Mr. Kaye took pains to render quite fair. Colours in 30 :—

Hair	Red	Light	Brown	Dark	Black	Total
Eyes, Light Grey, Blue	1	9	7	2	—	19
„ Dark Grey, Light Brown	1	—	2	2	—	5
„ Brown or Dark	—	—	3	2	1	6
Total	2	9	12	6	1	30

This district is markworthy in more than one respect. There has been, until quite lately, much in-and-in breeding; but I am told that the race is not only stalwart and long-lived, but very free from idiocy and insanity. The food is chiefly oat-cake, milk, and Yorkshire (wheaten) pudding, with bacon sometimes, but little other flesh-meat; home-brewed beer is used. See also the Lancaster return (98).

89. By James Ray Eddy, Esq., of Skipton, Superintendent of the Mines. 1 inch and 10½ lbs. allowed. Colours in 73 :—

Hair	Red	Light	Brown	Dark or Black	Total
Eyes, Blue or Light	4	10	22	11	47
„ Grey or Hazel	—	2	5	4	11
„ Brown	—	1	5	9	15
Total	4	13	32	24	73

Compare the returns from Wanlockhead, Allenheads, Cardiganshire, and Devonshire.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
86.	East Riding (except Hull and Beverley)	Men in the Hull Police Force	28		5 9·62	168·4	1·7693	71·39
	Hull, Beverley, and York	Ditto, ditto	18		5 9·10	160·0	1·7561	67·58
87.	Ripon, Kirkby Overblow, and the plain of York	Rural or semi-rural population of all classes	20	5 8·55		160·2	1·7093	68·03
88.	Bentham and neighbourhood, West Riding, on Lancashire and Westmoreland border	Farmers, tradesmen, etc., taken as met with: population of a mountainous district	26	5 10.01		177·16	1·7561	74·84
		Of these farmers	11	5 10·72		192.9	1·7739	81·64
		Residue	15	5 9·49		165·6	1·7434	69·85
89.	Grassington & neighbourhood, Upper Wharfedale; (with 8 Airedale and 2 Nidderdale men)	All the lead-miners, including a few smelters, ore-dressers, etc., employed in the Grassington and Conorley mines	74	5 8·18		156·48	1·7073	66·22

86. By Kelburne King, M.D., F.A.S.L., whose report included the whole Police Force of Hull. Heights accurate; weights rather loose. 11 lbs. allowed.

See above. 25 Lincolnshire men, in the same report, averaged 5 feet 9·60 inches and 169·3, and 15 Irishmen 5 feet 9 inches and 164·4.

There is a great preponderance of light and brown hair over dark shades in all these East Riding reports, whether from town or country.

87. From two small reports by Dr. Paley, of Ripon, and Dr. James Wood, of Kirkby Overblow, with additions. The Ripon men were mostly farm servants. ·9 inch and 10·2 lbs. allowed.

88. By J. W. Kaye, Esq., F.A.S.L., Bentham. ·9 inch and 12·16 lbs. allowed. A very accurate return, which Mr. Kaye took pains to render quite fair. Colours in 30 :—

Hair	Red	Light	Brown	Dark	Black	Total
Eyes, Light Grey, Blue	1	9	7	2	—	19
„ Dark Grey, Light Brown...	1	—	2	2	—	5
„ Brown or Dark	—	—	3	2	1	6
Total.....	2	9	12	6	1	30

This district is markworthy in more than one respect. There has been, until quite lately, much in-and-in breeding; but I am told that the race is not only stalwart and long-lived, but very free from idiocy and insanity. The food is chiefly oat-cake, milk, and Yorkshire (wheaten) pudding, with bacon sometimes, but little other flesh-meat; home-brewed beer is used. See also the Lancaster return (98).

89. By James Ray Eddy, Esq., of Skipton, Superintendent of the Mines. 1 inch and 10½ lbs. allowed. Colours in 73 :—

Hair	Red	Light	Brown	Dark or Black	Total
Eyes, Blue or Light ...	4	10	22	11	47
„ Grey or Hazel ...	—	2	5	4	11
„ Brown.....	—	1	5	9	15
Total	4	13	32	24	73

Compare the returns from Wanlockhead, Allenheads, Cardiganshire, and Devonshire.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight.	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
90.	Farnley (near Leeds) and surrounding villages and country	Smiths, puddlers, furnace-men, and others engaged in the smelting and working of iron	55	5 7·66		162·0	1·6940	68·71
91.	Ditto, ditto	Unskilled labourers in the same iron-work	24	5 6·53		149·2	1·6680	63·13
92.	Ditto, ditto	Various occupations, as clerks, carpenters, weavers, with a few of the upper class	30	5 8·59		156·1	1·7228	66·22
93.	Haworth and neighbouring district, West Riding	Weavers, over-lookers, and others, employed in the woollen manufacture at Haworth	52	5 7·33		151·0	1·6858	63·95
94.	Keighley and Bingley, West Riding	As above; also at Haworth	20	5 6·46		144·2	1·6688	60·86
		Ditto; entire report (93, 94, 99)	91	5 6·91		147·6	1·6750	62·41
95.	Sheffield, town and suburbs	Almost all employed in some branch of cutlery manufacture (see details below)	100	5 6·55		142·5	1·6723	60·28
	Town alone		88	5 6·50		142·2	1·6710	60·10
	Suburbs		12	5 6·87		144·8	1·6800	61·23
		Policemen	5	5 10·0		160·4	1.758	68·03

No.	REMARKS.
90 91 92	These three are divisions of one large return sent by W. J. Armitage, Esq., of Farnley, through Dr. Armitage. 1 inch and 10½ lbs. allowed in the first, ·9 inch and 10 lbs. in the second, ·8 and 10·1 lbs. in the third division. Farnley is a half suburban coal and iron district. The natives have mostly the light-haired, grey- or light brown-eyed type which is so prevalent in the West Riding.
93.	This and the next item, together with No. 99 from Lancashire, are portions of one valuable report by Dr. A. Ingham, of Haworth, including altogether 91 individuals, workers in the woollen factories there. I allow 1 inch and 10 lbs. for shoes (or clogs in some cases) and clothes.
94.	In 69 men the colours are given as follows :—

	Red	Fair	Dark	Black	Total
Eyes, Blue or Grey	3	10	22	—	35
„ Dark Grey (neutral)	1	6	9	2	18
„ Brown, etc.	1	2	10	3	16
Total	5	18	41	5	69

Some shades of hair which Dr. Ingham calls "dark brown" would, no doubt, be "brown" on my scale. The notable point here is the prevalence of neutral eyes, often conjoined with light hair, in Airedale and the neighbouring highlands. I myself found 24 per cent. of neutral-eyed persons at Skipton-in-Craven.

Haworth is a bleak elevated moorland district, with a mainly manufacturing population, in scattered villages and hamlets. Keighley and Bingley are neighbouring towns; their population is, I think, pretty purely indigenous; but the difference in this otherwise homogeneous report between the town-born and the country-born men is striking.

95. This is an abstract of several reports compiled for me in Sheffield by the Rev. J. Lettis Short, who was assisted by Dr. Aveling, and by several of the local manufacturers. ·75 inch and 9·7 lbs. are allowed for shoes and clothing, and I have varied this allowance as seemed fit in the several subdivisions; the file-makers, for example, were measured in very light shoes, the smiths in thick shoes, or even in clogs. The policemen,

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
		Merchants and manufacturers	4	5 7·6		156·5	1·697	66·43
		Clerks and warehousemen	9	5 7·4		133·1	1·695	56·00
		Smiths, furnacemen, moulders, rollers, etc.	13	5 7·4		157·3	1·680	66·67
		Scissor-makers	12	5 6·1		134·7	1·664	57·15
		File-makers	13	5 4·4		129·6	1·624	54·88
		Cutlers not otherwise specified	31	5 6·3		142·5	1·670	60·32
		Horn-workers	9	5 6·9		145·7	1·682	61·68
		Labourers	4	5 4·7		137·0	1·624	57·60
96.	Southern part of the West Riding, excluding Sheffield and suburbs	Persons of various occupations living in Sheffield; viz.:—	30	5 7·78		147·0	1·7023	62·14
		Policemen	6	5 9·91		156·6	1·75[illegible]6	66·22
		Filemakers, etc.	6	5 5·66		136·0	1·6510	57·42
		Smiths, horn-workers, joiners, etc.	18	5 7·77		147·5	1·7020	62·36
97.	Yorkshire in general, except the northern parts, especially York, Hull, and Halifax	From several reports; mostly persons living in towns, of all classes and occupations	40	5 8·01		154·1	1·7079	65·36
98.	Lancaster and neighbourhood, including the Bentham district (88)	Attendants in the County Lunatic Asylum; fair sample	19	5 9·97		179·4	1·7579	76·20

No.	REMARKS.
	who were admitted to represent the classes of men picked for superiority in physique, were the only ones in the local force, over 23 years of age, who were natives of Sheffield. Of the 91 persons connected with the iron and cutlery manufacture, the averages would be 5 feet 6·43 inches and 141·76 lbs. Mr. Short's report comprised a good many natives of other places than Sheffield, who have been distributed under their proper heads. Comparatively few of them were cutlers, file-makers, etc.; and I presume these occupations are usually hereditary. As for colour, there are doubtful indications that the Sheffield men are oftener dark-haired than those of the surrounding country, who are decidedly fair. The family names yield no evidence of much immigration from a distance. The fair men are conspicuously larger than the dark, the light and brown-haired averaging 5 feet 7·3 inches, the dark brown 5 feet 5·8 inches, and the black 5 feet 5 inches only. But no such difference is to be noted in other returns from Yorkshire.
96.	This is a part of Mr. J. Lettis Short's series of returns from Sheffield. I have made allowances of ·8 inch and 10 lbs., slightly varied for the subdivisions. The policemen are included simply for the sake of a fair comparison with the genuine natives of Sheffield; but even if they are excluded, the country-born men retain the advantage.
97.	Mostly from Hull, Kidderminster, and Bristol returns, by Messrs. Casson and Stretton and myself. A remarkably fair and varied sample of town-dwelling population, as regards classes and occupations. ·8 inch and 10 lbs. allowed. Hair in 37—1 red, 8 fair, 12 brown, 13 dark, 3 black.
98.	By Dr. Niel Gray Mercer, Assistant Medical Officer. These men are a fair sample of a picked class. 8 of them, from Bentham and adjacent parishes, average 5 feet 10·7 inches and 192 lbs. 5 Lancaster men 5 feet 8·7 inches and 161·6 lbs. ·8 inch and 11·4 lbs. allowed.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
99.	Colne, Trawden, and neighbourhood, Lancashire	Part of the Haworth return (93); woollen weavers, etc.	19	5 6·21		141·8	1·6573	59·87
100.	Manchester and Lancashire in general	Artizans, labourers, etc., living in Manchester	13		5 5·07	136·8	1·6521	58·05
101.	Manchester, Haslingden, and Lancashire in general	Various occupations, mostly out-door; *e. g.*, quarrymen and navvies; collected from several reports	20	5 7·80		153·3	1·7002	65·00
102.	Gainsborough and neighbourhood	Inhabitants of Gainsborough, born there or in the neighbourhood; mostly of the working class; occupations various	33		5 7·78	153·78	1·7226	65·21
103.	Walesby, near Market Rasen, in Lindsey	Rural population	21	5 8·26		164·3	1·7119	69·85
104.	Boston	Men born and living in Boston; many of old local descent: Labourers, tradesmen, artizans, fishermen, & policemen	34		5 8·4	165·4	1·7383	70·48
105.	Villages near Boston	People living in Boston; mostly labourers	15	5 9·68		174·3	1·7480	74·38

No.	REMARKS.
99.	By Dr. Ingham (see 93). 1 inch and 9·8 lbs. allowed for shoes, or clogs, and clothing.
100.	Part of a return from Manchester, by Dr. Fairbank, Hon. Sec. Manch. Anthr. Soc. 8·8 lbs. allowed.
101.	·9 inch and 10 lbs. allowed.
102.	By Draper Mackinder, M.D., etc., of Gainsborough. Apparently a very fair sample, and a valuable contribution. I have allowed 10 lbs. for clothes. Colour of eyes and hair:—

	Fair	Brown	Dark Brown	Black	Total
Blue or Grey	4	8	7	2	21
Dark Grey	—	—	3	—	3
Brown	—	6	2	1	9
Total	4	14	12	3	33

103.	By Elam Cartwright, Esq., Walesby. ·9 inch and 10·3 lbs. for shoes and clothes. Colours of Eyes: 12 blue, 1 grey, 5 hazel, 3 dark.
104.	By Mercer Adam, M.D., F.A.S.L., etc., Boston. The inclusion of 4 policemen may raise the average a little too high, but otherwise Dr. Adam thinks it fair. 10 lbs. allowed.
105.	Also by Dr. Adam. In this and the two next returns I allow ·9 inch and 10·3 lbs. for shoes and clothes.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
106.	Leverton and Stickney: villages on the edge of the Fens	Villages on the edges of the Fens; rural population	24	5 7·73		158·7	1·6985	67·31
107.	Long Sutton, South-east Lincolnshire	Labourers who entered a druggist's shop one Saturday evening	26	5 7·77		157·1	1·6995	66·58
108.	Stoke Rochford and Colsterworth, near Grantham	Village population; all classes	20	5 8·00		162·1	1·7066	68·94
109.	Lincolnshire in general	Miscellaneous	10	5 8·35		152·9	1·7168	64·81
110.	Lincolnshire	Total	183	5 8·43		159·0	1·7180	67·50

106. For this return also I am indebted to the exertions of Dr. Adam; but the particulars were ascertained by others. The colours of hair were noted in 59 cases out of the three returns. There were 7 red, 12 fair, 10 brown, 20 dark brown, and 8 black; but Dr. Adam's nomenclature of colour must differ somewhat from mine. The Bostonites are a very fair people, compared with Englishmen in general, but hazel eyes are very common among them: they much resemble, in my opinion, the inhabitants of some parts of the Netherlands.

107. By Arthur B. Ewen, F.A.S.L., etc., Long Sutton. From the mode in which the return was got, Mr. Ewen thinks it yields a fair average of the labouring population. Long Sutton is a low-lying district, not true fen, but chiefly land reclaimed from the Wash. There is much opium consumed there. Colours of eyes and hair:—

	Fair	Brown	Dark Brown	Black or very dark	Total
Blue, Grey, Green-Grey ...	6	7	1	—	14
Dark Grey.....	—	1	2	1	4
Brown.....	—	—	3	5	8
Total	6	8	6	6	26

108. A very fair return, by the late Rev. Richard Cartwright, rector of Stoke. ·85 inch and 10·1 lbs. allowed.

109. Mostly from my own Bristol return. ·8 inch and 10 lbs.

110. No English county, not even Yorkshire, is better represented in my lists than Lincolnshire, regarding the number and careful execution of the returns, the variety of their composition, and the proportion of the several elements of population. Only the upper class is ill represented. The Lincolnshire men exceed the average of England both in height and weight. The race is Anglo-Danish. The Keltic element is probably very weak. In most parts of the county fair and light brown hair preponderate over dark. In these returns the fair men have generally the advantage in height, but not in weight.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
111.	Lynby, 7 miles north of Nottingham	Rural population; mostly labourers	20	5 9·07		164·	1·7307	69·62
112.	Nottingham and suburbs	Warehousemen	26	5 7·53		142.4	1·6977	60·05
113.	Nottingham and suburbs	Workmen in a lace factory	23	5 6·54		139·1	1·6723	58·78
114.	Newark and neighbourhood	All classes: town and country	30	5 8·55		163·1	1·7206	69·31
115.	Nottinghamshire in general, especially the Sherwood district	Men employed in Butterley iron-works; mostly unskilled labourers	22	5 6·96		146·8	1·6790	62·04
116.	Ditto, ditto	Miscellaneous	17	5 7·82		155·5	1·7015	66·00
117.	Nottinghamshire	Total	138	5 7·76		151·8	1·7006	64·31

No.	REMARKS.

111. I owe this and the two following returns to my friend Dr. Tindal Robertson, of Nottingham. They are particularly valuable as furnishing means for a comparison of town and country populations: the contrast in this case is great. I allow ·97 inch and 10·5 lbs. for shoes and clothes. The colours of the eyes and hair in the countrymen were as follows:—

	Red	Fair	Brown	Dark	Black	Total
Blue or Grey	1	2	7	1	—	11
Dark Grey	—	1	2	—	—	3
Brown, etc.	—	—	1	3	2	6
	1	3	10	4	2	

112, 113. In these two reports I have allowed ·73 inch and 10 lbs. and 9·5 lbs. for shoes and clothes. In 48 the colours were:—

Hair	Red	Fair	Lt. Brown	Brown	Dk. Brown	Black	Total
Eyes, Blue or Grey ...	2	4	5	10	3	—	24
„ Dark Grey	1	—	—	3	1	—	5
„ Brown, etc.....	—	—	—	8	5	6	19
	2	4	5	21	9	6	48

The dark men here exceed the fair in stature.

114. By S. Job, Esq., of Newark. Probably a very fair sample of the population of the town and neighbourhood. Weights very exact, but stature given in inches only. I allow ·85 inch and 10·1 lbs. for shoes and clothes.

115. I owe this return to my late friend J. T. Featherstone, Surgeon to the Butterley Ironworks, who lost his life, shortly after he had compiled it, by a lamentable accident. ·9 inch and 10 lbs. allowed.

116. Extracted from the Bristol, Sheffield, and Farnley returns. ·87 inch and 10 lbs. allowed.

117. The middle class is hardly at all represented in the Nottinghamshire returns, except in 112 and 114; otherwise the county is probably pretty fairly exhibited. Notable points are, that the men are generally

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
118.	Derbyshire (Central D. especially)	Persons variously employed about the Butterley iron-works, near Alfreton	34	5 8·24		156·1	1·7114	66·26
119.	Northern Derbyshire	Part of the Sheffield police force	11		5 9·41	167·6	1·7640	70·98
120.	Derbyshire in general	Mixed, in the returns from Sheffield and other towns	14	5 7·21		152·8	1·6878	64·86
121.	Wetton, near Longnor, in the North Staffordshire Moorlands	Rural population; all classes and occupations; a very fair sample apparently	20	5 9·72		164·0	1·7465	69·39
122.	The Staffordshire Pottery District	Potters employed in various branches of the manufacture at the Etruria Pottery	25	5 7·18		147·54	1·6875	62·59
123.	Burton-on-Trent, and the eastern parts of Staffordshire	A mixture of town and country people; about half of the middle class	18		5 8·86	166·0	1·7500	70·53
124.	Staffordshire in general	Mixed; from various reports; many iron-workers	25	5 7·54		158·4	1·6962	67·31
125.	Staffordshire	Total	88	5 8·36		157	1·7163	66·67

No.	REMARKS.
	rather tall, but of comparatively light weight; that there is evidence of physical degeneration in Nottingham; and that, whether from admixture of blood or other causes, the general fairness of the people is a little less conspicuous there. The race is still Anglo-Danish, with comparatively little admixture of the Keltic element.
118.	By my late friend J. F. Featherstone, Esq., of Codnor Park, Alfreton. See 115. ·9 inch and 10 lbs. allowed.
119.	By Dr. Aveling, through the Rev. J. Lettis Short. 11·1 lbs. allowed.
120.	·8 inch and 9·8 lbs. allowed.
121.	Mr. Samuel Carrington, for Dr. Barnard Davis, F.R.S. ·9 inch and 11 lbs. allowed.
122.	Dr. Barnard Davis himself procured this for me. ·78 inch and 9·54 lbs. allowed. **Eyes: Blue or Grey in 18; Brown in 7.** **Hair: Red, 1; Fair, 1; Light Brown, 9; Brown, 7; Dark Brown and Black, 7.** The occupation of potters is generally hereditary.
123.	Wm. Molyneux, Esq., Burton-on-Trent, through Dr. Barnard Davis. 10½ lbs. allowed. Heights seldom carried beyond inches, but weights in pounds. Extremes 5 feet 4 inches and 6 feet 2 inches. Only one corpulent man. The average looks high, but the neighbourhood does produce many large men. The fair men in this return much exceed the dark in both respects.
124.	·8 inch and 10 lbs. allowed.
125.	Staffordshire, except the "black country," is pretty well represented in these four returns. The native race is large and generally rather fair-complexioned.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
126.	Congleton, Cheshire	Silkspinners: a fair sample	19	5 5·81		145·7	1·6545	61·90
127.	Cheshire in general	Miscellaneous; from several reports	7	5 8·23		155·4	1·7137	65·95
128.	Countesthorpe, Leicestershire	Frame-work knitters	29	5 8·62		155·6	1·7231	66·04
129.	Countesthorpe	Labourers and other out-door workmen	15	5 7·36		151·4	1·6890	64·13
130.	Leicester and neighbourhood	Frame-work knitters and others living in Leicester	10		5 6·55	159·4	1·6913	67·76
131.	Leicestershire in general	Miscellaneous: employed some in town, some in country	11	5 8·34		149·1	1·7155	69·10

No.	REMARKS.

126. By Robert Beales, Esq., M.D., Congleton. ·71 inch and 9·2 lbs. allowed.

Hair	Red	Light	Brown	Dark or Black	Total
Eyes, Light	2	3	1	4	10
„ Neutral	—	2	1	—	3
„ Brown	—	—	2	5	7
Total	2	5	4	9	20

The contrast between these small dark men and their neighbours is well marked.

127. ·83 inch and 10 lbs. allowed.

128. By the Rev. J. P. Tomkins, M.A., of Great Peatling. A fair sample, taken at a rural station. I allow ·82 inch and 10 lbs. for shoes and clothes. Colour :—

Hair	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	2	6	1	—	9
„ Brown	—	11	—	10	21
Total	2	17	1	10	30

129. Also by the Rev. J. P. Tomkins. ·9 inch and 10 lbs. for shoes and clothes. The colours are :—

Hair	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	—	7	2	1	10
„ Brown	—	5	—	—	5
Total	—	12	2	1	15

130. By W. R. Cole, Esq., for John Bowman, Esq. 10 lbs. allowed for clothes.

131. From other reports. ·84 inch and 10 lbs. for shoes and clothes. Colours in 20 men in this and the last lot :—

Hair	Light	Brown	Dark	Black	Total
Eyes, Blue or Grey	2	5	1	—	8
„ Light or Dark Hazel	2	5	3	2	12
Total	4	10	4	2	20

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
132.	Leicestershire—total		65		5 7·24	154·1	1·7095	65·36
133.	Cottesmore, Rutland	Agricultural labourers: taken as met with	16	5 7·00		153·4	1·6799	65·04
134.	Silverstone and Evenley, South-west Northamptonshire	Purely rural population (farmers and labourers)	21	5 8·62		157·6	1·7185	66·67
135.	Radstone and Syresham, South-west Northamptonshire	Rural population, including village artizans	21	5 7·57		154·6	1·6977	65·58
136.	Heyford, Bugbrook, and neighbourhood, South-west Central Northamptonshire	Village artisans, agricultural labourers, quarrymen, etc., very fairly taken	32	5 7·48		156·6	1·6952	66·50
137.	Heyford, Stowe, and as above	As above, and also a fair sample	20		5 7·50	160·5	1·7155	68·26

No.	REMARKS.

132. All these returns, as well as that from Mr. Buck, of the Leicestershire Asylum, agree in indicating a high average of stature among the Leicestershire folk. The large proportion of brown eyes, amounting to more than a half, is remarkable. I have found the same type of man abundant in the adjoining portions of Northamptonshire and East Warwickshire. Compare also Prof. Phillips's observations (quoted in the *Crania Britannica*), who supplies a possible explanation.

133. By the Rev. Stephen Miles, of Cottesmore. ·9 inch and 10 lbs. allowed. Mr. Miles says most of the men were dark-haired. Rutland is, I believe, free from any sign of Danish occupation, and the people somewhat differ in type from both the Lincolnshire and the Leicestershire men.

134. Rev. W. Andrew, rector of Whitfield, near Brackley. This return and the next, which also I owe to Mr. Andrew, are composed of observations made for him by the parish schoolmasters. I allow 1 inch and 10·6 lbs.

135. Here I allow ·77 inch and 10 lbs. Of 22, 14 had light and 8 dark eyes; the hair is set down as light in 10, dark or black in 12. The figures in this second return are given in inches and stones only; in the first one they are more exact.

136. John Beddoe, Esq., and Mr. J. Smith. The district is rural and pastoral in the main, but ironstone is quarried and smelted near Heyford. Both this and the next return are pretty minute as to weight, but in this one most of the measurements are given without fractions of an inch. I allow ·78 inch and 10 lbs. for shoes and clothes.

137. John Beddoe, Esq., and Mr. E. Jones. 10 lbs. allowed for clothes. The colours are given as follows in 60 men:—

Hair	Light	Brown	Dark	Black	Total
Eyes, Blue or Grey	10	16	10	2	38
„ Dark Grey, etc....	—	1	4	—	5
„ Brown, etc.....	2	3	11	1	17
Total	12	20	25	3	60

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
138.	Wellingborough, Northamptonshire	Fifteen bootmakers, the rest bricklayers, etc.	23	5 7·87		148·1	1·7046	62·63
139.	Northamptonshire in general	Miscellaneous; from various reports: a good many being unskilled labourers in ironworks	19	5 6·37		142·9	1·6664	60·28
140.	Northamptonshire—total		136	5 7·71		152·9	1·6990	64·78
141.	Flegg, N.E. Norfolk ...21 Sustead, N.E. Norfolk... 9	A very fair sample of a rural population, including all classes	30		5 8·94	175·4	1·7521	74·61
142.	Ormesby and other fishing villages near Flegg-Burgh	Fishermen	30		5 8·25	153·9	1·7345	64·86

No.	REMARKS.
138.	W. W. Clark, M.D., Wellingborough. Heights in inches only. I allow ·8 inch and 10 lbs. for shoes and clothes. The average height appears markworthy, but Dr. Clarke says the shoemakers of Wellingborough are generally tall and thin. The average of the 15 is 5 feet 8 inches and 146 lbs., so that they are taller and lighter than the other men. They are also darker in eyes and hair, but the numbers are of course insufficient in that point of view.
139.	I allow ·8 inch and 10 lbs. for shoes and clothes. The averages here are singularly low; but the list includes a number of a class by no means favoured.
140.	It is evident, nevertheless, that the Northamptonshire breed is in general of stature fully equal to the average of England.
141, 142	I owe these valuable data to J. T. Waller, Esq., M.R.C.S., of Flegg Burgh: incorporated with them are observations taken at Sustead by Basil Edwards, Esq. 10·9 lbs. allowed for clothes in each case. Sustead is a little to the N.W. of Flegg. Both districts are purely rural, and extend to the coast. Flegg is flat and well watered; it is remarkable for the almost exclusive prevalence of Danish local names, such as Ormesby, Repps, etc. The great stature and fair complexion of the people are noteworthy in relation to this fact. Mr. Waller informs me that if he had not, in the case of some almost gigantic families, confined himself to measuring but one specimen, the average might have been higher.

The following are the complexional colours, as reported to me :—

	Blue or Grey Eyes.				Dark Eyes.		
Hair.....	Red	Light	Dark	Black	Light	Dark	Black
Landsmen	4	15	3	1	1	6	—
Fishermen	—	12	5	2	—	8	3
Total	4	27	8	3	1	14	3

It will be seen that the two sections differ much in size and colour: the landsmen being fairer, taller,

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
143.	Norwich and neighbourhood	Infirmary out-patients, with trivial or accidental complaints	24	5 6·79		144.1	1·6774	61·00
144.	Neighbourhood of Lynn Regis	Ditto, ditto; mostly agricultural labourers	12	5 7·68		147·75	1·6977	62·47
145.	Lynn Regis	Mixed, including several fishermen; mostly of old local descent	18	5 8·20		154.94	1·7129	65·54
146.	Norfolk in general, especially Norwich	Very various, and from several reports	10	5 8·20		151·3	1·7129	64·09
147.	Haverhill, South-west Suffolk	Labourers, etc.	21	5 6·60		147·0	1·6723	62·14
148.	Bury St. Edmund's and neighbourhood	Chiefly tradesmen and artizans	29		5 7.38	161·4*	1·7124	68·94
149.	Laxfield (village in East Suffolk)	Agricultural labourers, artizans, and small tradesmen, members of a Friendly Society	25	5 6·66		153·2	1·6723	64·95

No.	REMARKS.
	and much heavier than the fishermen. I cannot explain this, unless conjecturally. In both sections the fair men are conspicuously taller than the dark, and in the landsmen also much heavier, the fair men averaging 5 feet 9·9 inches and 188 lbs. The once well-known "Norfolk giant" was born in the neighbourhood of Flegg.
143.	By Dr. M. Beverley, through W. Cadge, Esq., F.R.C.S. ·79 inch and 9·6 lbs. allowed. See 144, and the similar returns from Bristol and Taunton. The population of Norwich includes numerous descendants of Protestant refugees from France and the Low Countries.
144.	By Dr. John Lowe, F.L.S. ·88 inch and 10 lbs. allowed. Of 37, in this and the preceding report, 28 had blue or grey eyes, 1 light brown, and 8 brown. The light-haired men were rather taller than the dark.
145.	Also by Dr. Lowe. ·8 inch and 10·44 lbs. allowed.
146.	·8 inch and 10 lbs. allowed.
147.	Dr. Bath Smart, of Manchester, F.A.S.L., procured this return for Dr. Barnard Davis; the observations were made by Mr. D. Gurteen. I believe the men were measured in shoes, but am not certain; however, I allow ·8 inch and 10 lbs. for shoes and clothes. Grey eyes, brown (or dark brown) hair, oval faces, round foreheads, straight noses, are reported to prevail. The heads of 17 averaged 22·55 inches in circumference.
148.	22 are from a report by Dr. J. W. J. Oswald. I believe they were members of a masonic lodge. The remainder were collected from several reports. On the whole, the sample is carefully taken, and is probably a pretty fair one, including a full proportion of the middle class. * In reckoning the weights I have excluded one very corpulent man; but obesity is apparently common in Suffolk. I allow 9·4 lbs. for clothing. Of 29, 8 had brown eyes, 17 hair of a medium brown, and only 8 dark brown hair; black did not occur.
149.	Dr. Henry Gramshaw, of Kelsale Hall, Framlingham. From the mode in which it was procured, this return must be a fair sample of the class. ·86 inch and 10 lbs. allowed. Half the men had brown eyes, and most of them medium brown hair.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
150.	Thorney and neighbourhood, Isle of Ely	Miscellaneous: village and agricultural population	25	5 8·43		163·	1·7155	69·17
151.	Parson Drove, near Wisbeach, and neighbourhood, Isle of Ely	Same as above	25	5 7·50		148·8	1·6874	62·95
152.	Isle of Ely. Average of the two preceding	As above	50	5 7·96		155·9	1·7014	66·06
153.	Cottenham, Histon, and other villages in South Cambridgeshire	Labourers, with a few village artizans	35	5 6·63		156·54	1·6723	66·46
154.	St. Neot's and neighbourhood, Hunts	Artizans and labourers	14	5 6·55		151·07	1·6703	63·98
155.	Dedham, Essex, and neighbourhood	Labourers and a few artizans	15	5 7·66		145·5	1·6977	61·45
156.	Rochford, Essex, and neighbourhood	Tradesmen and artizans, etc.	15		5 6·46	139·6	1·6890	58·96
157.	Essex in general	Miscellaneous; from several reports	10	5 7·78		150·1	1·7023	63·54

No.	REMARKS.
150.	By Lawrence Clapham, Esq., L.R.C.P., of Thorney Abbey. See next report. Excluding two corpulent persons, the average weight would be 157 lbs. ·93 inch and 10½ lbs. allowed.
151.	By H. Stuckey, Esq., M.D., of Parson Drove. This and the last report, taken together, yield probably a fair sample of the population of the Fens. Dr. Clapham's report contains more of the middle class, and fewer labourers and artisans, than Dr. Stuckey's; both are very exact as to weight, but in the latter the measurements are seldon carried beyond inches. ·9 inch and 10 lbs. allowed.
152.	Colours of hair and eyes in 50 :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	—	13	9	1	—	23
„ Hazel, Brown, Black	1	—	13	10	3	27
Total	1	13	22	11	3	50

The number of brown eyes is here remarkable; there is a great excess of them at Parson Drove. There is some ground for suspecting that a Welsh or aboriginal population lingered longer in the Fens than in the east of England generally. The long legs of the Fenlanders have been remarked by Kingsley (Hereward).

153.	Samuel Wright, Esq., of St. Neot's, Hunts. ·83 inch and 10 lbs. allowed. 11 of 39 had dark eyes. The dark-haired men average higher than the fair. The reverse is the case at Thorney.
154.	Also from Mr. Wright's returns. Allowances as before. 9 out of 15 are marked as having brown or dark eyes.
155.	By Aynott Chitty, Esq., Dedham. ·86 inch and 10 lbs. allowed. Much difficulty with the men.
156.	By Dr. J. W. J. Oswald, Rochford. 9·6 lbs. allowed. The district is, or has been, very malarious.
157.	·8 inch and 10 lbs. allowed. These Essex reports are all rather small for the purpose. 6 black-haired men average but 5 feet 5 inches.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
158.	Sharnbrook, North Bedfordshire	Agricultural and other outdoor labourers; taken at random	24	5 7·41		163·0	1·6900	69·17
159.	Luton and other places in South Bedfordshire	Farm labourers, village artizans, etc., living at Harpenden, Herts. None of the upper or middle class	36	5 6.36		143·3	1·6646	60·46
160.	Bedfordshire in general	A mixture of all classes; from various returns	10	5 7·50		163·3	1·6952	69·53
161.	Harpenden, a village or small town in Hertfordshire, and neighbourhood	Almost the whole male population of suitable age	182	5 6·29		147·91	1·6634	62·59
		Farm labourers (included above)	60	5 5·93		145·1	1·6532	61·27
		Labourers unspecified (ditto)	26	5 6·01		145·8	1·6557	61·59
		Favourable occupations (ditto); *i.e.*, upper and middle class, smiths, masons, carpenters, railway-men, etc.	45	5 7·27		154·8	1·6883	65·67
		Doubtful occupations: dealers, servants, some artizans, etc.	27	5 6·47		150·7	1·6690	63·81
		Grooms	9	5 4·83		145·3	1·6273	61·45
		Unfavourable occupations: tailors, shoemakers, painters, etc.	15	5 5·88		140·4	1·6540	59·41

158. By R. S. Stedman, Esq., of Sharnbrook. ·91 inch and 10·5 lbs. allowed.

Hair	Red	Light Brown	Brown	Black (?)	Total
Eyes, Grey	2	3	6	—	11
„ Brown	—	—	8	5	13

159. This is a portion of the return of Mr. Hodgson, of Harpenden. ·86 inch and 10 lbs allowed. Colours:—

Hair	Fair	Brown	Dark Brown	Black	Total
Eyes, Light	3	8	7	1	19
„ Dark Grey	3	1	1	—	5
„ Light Brown	1	3	3	1	8
„ Dark Brown	—	1	2	1	4
Total	7	13	13	3	36

These colours differ a good deal from those of Hertfordshire (161); there being more brown eyes, and less dark hair; and the relations of colour to size differ also, the fair and black men being largest.

160. ·8 inch and 10 lbs. allowed.

161. This is one of the most valuable of the reports, for minute accuracy as well as for extent; the weights are given to an ounce. I owe it to Henry Hodgson, Esq., of Harpenden. 12 men are included from Hertford and Watford, sent by Mr. E. Noble Smith and Dr. Brett. They mostly belong to the upper class, which is a little deficient in Mr. Hodgson's report; so that the whole may probably be taken as a fair representation of the entire population.

The height of heels averaged 1·1 inch; but this does not imply an equal addition to stature; I should think ·84 inch a sufficient deduction for shoes, and 9·91 lbs. for clothes. Colours in 168:—

Hair	Red	Fair or Lt. Brown	Brown	Dk. Brown	Very Dk. Brown	Black	Total
Eyes, Blue or Light Grey	4	20	24	40	9	11	108
„ Dark Grey	—	—	1	7	1	4	13
„ Light Brown	—	4	4	6	—	6	20
„ Brown, Dk. Brown	1	1	5	10	1	9	27
Totals	5	25	34	63	11	30	168

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight.	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
		Men with red hair	5	5 5·70				
		,, light brown hair, etc.	25	5 5·32				
		,, brown hair	34	5 5·74				
		,, dark brown hair	63	5 6·83				
		,, very dark brown hair	11	5 7·54				
		,, black hair	30	5 5·62				
162.	Spitalfields, London	Silk-weavers	18	5 1·40		106·9	1.5477	45·35
163.	London, all parts	Miscellaneous; collected from divers reports; from all parts of England	57	5 6·72		147·0	1·6752	62·13
164.	Nash, North Buckinghamshire	Farmers, labourers, and villagers; from several reports	13	5 8·34		155·6	1·7155	65·81
165.	Witney and neighbourhood, Oxfordshire	All labourers, except two	19		5 5·00	145·4	1·6520	62·36
166.	Oxfordshire generally	Very various; from several returns	14	5 6.85		147·5	1·6785	62·36
167.	Leamington, Warwick, Stratford, & Kenilworth	Townsmen, & almost all artizans of various kinds; fairly taken	27	5 6·93		149·0	1·6812	63·04
		The same, with 7 added; from various reports, including some upper class and picked men	34	5 7·52		154·1	1·6952	65·31

No.	REMARKS.
	The colours have been very carefully observed; but the nomenclature differs from my own. I should doubtless have called some of Mr. Hodgson's "dark browns" *brown*, and some of his "blacks" *very dark brown*. The relations of colour to stature are curious.
162.	By the Rev. Charles L. Corkran, City Missionary. I have allowed but half an inch and 6·9 lbs. The names of several of the men testify to their French descent.
163.	·8 inch and 10 lbs. allowed. Several of the upper or middle class, and a number of picked men, such as lunatic keepers, are included; so that I should think the averages likely to come up to the truth, if not to exceed it. The eyes are given as light, 24; neutral, 9; dark, 24;—the hair, red, 2; light, 9; brown, 26; dark, 13·5; black, 6·5. The large proportion of dark eyes is noteworthy: my own observations tend to confirm it.
164.	7 of these are from a list of farmers and labourers at Nash, by John Bowman, Esq. ·84 inch and 10·1 lbs. allowed. The numbers are few, and the averages perhaps too high; but compare the returns from South-west Northamptonshire, the adjacent district.
165.	By Augustine Batt, Esq., of Witney. 7·9 lbs. allowed. An extremely low average. That of the 17 labourers would be only 5 ft. 4·53 in. and 140·15 lbs. Eyes in 11 blue or grey, 2 hazel, 6 brown; hair in 10 brown, 5 dark, 2 black. Witney was formerly a manufacturing town.
166.	·8 inch and 10 lbs. allowed.
167.	By Dr. Carter, of Leamington. ·78 inch and 10 lbs. allowed. Heights seldom carried beyond inches. Eyes in 2 blue, 8 blueish-grey, 4 grey, 1 dark-grey, 2 hazel-grey, 2 hazel, 8 brown or black.
	·82 inch and 10·1 lbs. allowed. This may probably be a fair sample of the population of Central Warwickshire.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
168.	Birmingham	Wire-drawers	31	5 7·42		146.7	1·6931	62·14
169.	Birmingham	Brass founders (13), blacksmiths (6), silversmiths (5), and engravers (2), in an ecclesiastical metal factory	26	5 7·02		141·8	1·6829	60·00
170.	Birmingham	Mixed: from several reports	8	5 7·35		137·9	1·6913	58·05
171.	Kidderminster	Mixed; but mostly employed in the carpet manufacture as overlookers, etc.	14	5 6·82		146·6	1·6786	62·14
172.	Stourport and West Worcestershire	Working tanners	18	5 7·03		149·3	1·6800	63·18
173.	West Worcestershire	Upper and middle class, in town and country	10	5 10·1		177·5	1·7612	75·74
174.	West and Central Worcestershire	Agricultural labourers, gardeners, smiths, carpenters; from divers reports	23	5 8·14		161·6	1·7089	68·76
175.	Worcestershire	Total	65	5 7·85		157·4	1.7028	66·86

No.	REMARKS.
168.	By John Cornforth, Esq., Birmingham. ·8 inch and 9·7 lbs. allowed.
169.	By W. C. Aitken, Esq., Birmingham. This and the last report were both procured for me by Alfred Hill, Esq. ·8 inch and 9·5 lbs allowed. Including natives of other places, 12 blacksmiths averaged 5 feet 7·04 inches and 142·9 lbs.; 17 brass-founders, 5 feet 6·86 inches and 145·4 lbs.; 9 silversmiths and engravers, 5 feet 6·50 inches and 133·6 lbs.
170.	·8 inch and 9·9 lbs. allowed. Mr. Sargent, the well-known statistician, to whom I am much indebted, informs me that the average stature of the Birmingham volunteers is 5 feet 6½ inches.
171.	Part of a return by S. Stretton, Esq., M.R.C.S. ·77 inch and 9·6 lbs. allowed.
172.	By Joseph Rogers, Esq., Arley House. ·93 inch and 10 lbs. allowed.
173.	·8 inch and 10·5 lbs. allowed. Extracted from the preceding and following reports. Some remarkably fine men are accidentally included.
174.	·9 inch and 10·5 lbs. allowed. Partly from a friend at Orleton; partly from various other sources. The average may be too high; but if so, it is accidental.
175.	·85 inch and 10 lbs. allowed. Of 72, 45 had blue or light-grey eyes, 4 dark-grey, 1 light-hazel, 22 brown or dark eyes. The hair is comparatively dark; but the observers differ in their nomenclature. The fair men are generally tall, and the black-haired men very short.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
176.	Shrewsbury	Workmen employed about the Infirmary, and healthy working men with slight surgical ailments	34	5 6·72		149·4	1·6753	63·22
177.	Other parts of Salop	Ditto, ditto; part of same return	16	5 7·06		149·2	1·6840	63·13
178.	Salop, central and other parts	Miscellaneous; very varied; from divers reports	17	5 7·69		153·0	1·7000	64·86
179.	Knighton (border of Salop and Radnorshire), and neighbourhood	Members of a Provident Society: mostly farm labourers, country artizans, and sawyers	28	5 6·71		153·8	1·6736	65·22
180.	Salop	Total	95	5 6·94		151·3	1·6804	64·09
181.	Flintshire; mostly Hawarden and St. Asaph	Apparently a fair sample of the entire population, town and country, excepting only the highest class	35	5 6·99		158·5	1·6809	67·35
		Men with light hair	8	5 8·2		167	1·7120	71·21
		Men with black hair	11	5 6·2		157	1·6610	66·67
		Men with English names	9	5 8·1		165·4	1·7094	70·48
182.	Glan Ogwen, Caernarvonshire	Slate-quarrymen; all bearing Welsh surnames	32	5 6·78		167·36		

No.	REMARKS.
176.	By W. Eddowes, Esq., then H. S., Salop Infirmary, through Dr. Henry Johnson. ·8 inch and 10 lbs. allowed. About half of the men under this and the next item had surnames of Welsh type.
177.	By and through the same. Same allowances.
178.	Some of these from a report by the Rev. Dr. Rowley, Incumbent of Willey: several from Bristol and Kidderminster. ·8 inch and 10 lbs. allowed.
179.	By Charles J. Covernton, Esq., M.R.C.S. ·86 inch and 10 lbs. allowed. The race here is doubtless mainly Welsh in blood, though long Anglicised in speech. 17 of 28 bore Welsh surnames. Eyes in 8 blue, 7 grey, 2 dark grey, 11 hazel or brown.
180.	·82 inch and 10 lbs. allowed. Very few of the middle class are included.
181.	By Dr. Moffat, and valuable accordingly. ·84 inch and 10 lbs. allowed. Colours in 42 :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Blue, Grey, or Light	2	7	3	8	3	23
„ Brown or Dark	—	3	1	7	8	19
Total	2	10	4	15	11	42

There is no trace here of the tall Strathclyde Welshmen, said by Llhuyd to have colonised North-east Wales. The breed would seem to gain in stature by an English cross.

182.	By the Rev. John Price, Vicar of Bangor. A perfectly fair sample. 24 out of 34 are marked as dark-haired. ·93 inch allowed.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
181. bis.	Anglesey	Labourers	9	5 7·66		167·6	1·6967	71·21
182. bis.	Caernarvonshire	Quarrymen and labourers	26	5 8·12		159	1·7050	67·35
183.	North Wales	Mostly leadminers and stonemasons; from divers reports	22	5 6·72		150·2	1·6736	63·50
184.	North-east Cardiganshire	Leadminers employed in the Lisburne, Cwm Ystwith, Goginan, West Cwm Erfin, and Cefn Brwyno mines	328	5 7·30		155·22	1·6850	65·41
185.	Ditto, ditto	Clerks, masons, carpenters, carters, and labourers employed about the same mines	42	5 7·01		145.05	1·6774	61·25
		Total of all occupations	370	5 7·24		154·06	1·6835	64·95
		Ditto, *blue* or *grey eyes*, and red or sandy hair	44	5 7·60		153	1·6926	64·41
		Ditto, ditto, and fair or light-brown hair	50	5 7·41		155·7	1·6878	65·67
		Ditto, ditto, and brown hair	71	5 6·77		151·8	1·6715	63·95
		Ditto, ditto, and dark brown hair	20	5 6·94		150·4	1·6759	63·27
		Ditto, ditto, and black hair	59	5 7·57		151·3	1·6919	63·68
		Ditto, with *brown*, *hazel*, or *black eyes*, and red, etc., hair	8	5 6·30		158·2	1·6596	66·81
		Ditto, ditto, and fair, etc., hair	14	5 8·93		167·8	1·7264	71·12

No.	REMARKS.
181	By T. Williams, Esq., of Watchet, through John Bowman, Esq. The men were purely Welsh by names
182	and language; but the averages are rather high notwithstanding, and I suspect that some small men have
bis.	escaped. ·9 inch and 10·5 lbs. allowed.
183.	·87 inch and 10·2 lbs. allowed.
184	These returns, which I owe to Henry Taylor, Esq., Superintendent of the Mines, through the introduction
185	of Philip John Worsley, Esq., are perhaps the most valuable of all the contributions I have received. They embrace the whole mining population (of suitable age) of an extensive district, the elevated moorland and pastoral country about the upper valleys of the Ystwith and Rheidol. The evidence of the surnames indicates that the population is, with very few exceptions, of purely Welsh origin. Though the district is included in South Wales, I believe the dialect and traditional history indicate a community of blood with the North Welsh. The measurements are given to a quarter-inch, the weights to a pound. I allow 1 inch for shoes, and 11 lbs. for clothes, in the case of the miners, and 1 inch and 10 lbs. in the other men.
	It may be that a certain extent of selection takes place in the class of lead-miners, some weakly or puny children being excluded from the employment as unfit for it; but, allowing for this, these miners are probably a tolerably fair sample of a purely Welsh population.
	They are not small men: as many as 12 of the 370 exceeded 6 feet (in their shoes), but as a rule they are of moderate stature, and weigh well in proportion to their height.
	84 of them, or upwards of 22 per cent., would be excluded by the ordinary military standard of 5 feet 5 inches; but at the usual ages of enlistment this percentage would probably exceed 40.
	The colours have been carefully taken; but the nomenclature must differ a little from my own. Of Mr. Taylor's "*black-haired*" and "*brown-haired*" men, many would certainly have been called "dark brown-haired" by myself; and some of his "red or sandy-haired men" I should have called "fair", and some of his fair or light-brown-haired I should probably have called "brown".
	The relations between stature and colour are in the main, but not exactly, what might have been expected. The fair-haired men average highest in both height and weight, and the dark-brown are by much the smallest, but the black compete with the red for the second place. The combination of black

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
		Ditto, ditto, and brown hair	21	5 7·45		158·0	1·6888	66·72
		Ditto, ditto, and dark brown hair	11	5 5·41		147·1	1·6370	61·95
		Ditto, ditto, and black hair	68	5 7·38		153	1·6871	64·45
186.	Vale of Teivy, near Newcastle-in-Emlyn	Half farmers, the rest farm-labourers, etc.	29	5 8·54		175·9	1·7190	74·38
187.	Newcastle in Emlyn (small town), and neighbourhood	Professional men, farmers, shopkeepers, and artizans chiefly	25	5 8·70		163·9	1·7256	69·62
188.	Neath Valley, Glamorgan; and South Wales generally	Colliers (24) and others (9) employed about Pwllfaron Colliery, Glyn Neath	33	5 6·60		155·9	1·6697	65·95
189.	Abercwmlais, South Brecknockshire, and neighbourhood	Rural population; all classes	14	5 7·66		159·1	1·6977	67·39
190.	South Wales (including Monmouthshire)	All classes in pretty fair proportion, except agriculturalists; from divers reports	52	5 7·03		150·1	1·6794	63·50

hair with light eyes ranks high in the scale, as in many other districts; in Wales it belongs to what may be called the Kymric or Belgic type, as distinguished from the Iberian,* to which the generally small men, with dark eyes and skins, and dark but seldom coal-black hair, may be assigned.

186. Dr. David Davies, of Bristol, procured this return from a friend in Cardiganshire. ·9 inch and 11·9 lbs. allowed. Of 20, only 4 had dark eyes; the hair was red in 3, light in 10, dark in 6, black in 1 (the smallest man). These are light colours for a Welsh district. The surnames are all Welsh; but the district was in the middle ages colonised by Flemings, who may have melted down into the native population.

187. By the Rev. John Price Jones, Vicar of Newcastle. ·8 inch and 10·4 lbs. allowed. Colours in 41 :—

Hair	Red	Light	Brown	Dark	Black	Total
Eyes, Grey or Blue ...	4	9	1	9	1	24
„ Brown	—	—	1	8	8	17
Total.....	4	9	2	17	9	41

The same large bulky breed of men as in the preceding report, though the colours are darker.

188. By W. Eassie, Esq., F.G.S., etc. ·9 inch and 10·5 lbs. allowed. The surnames of the men, with very few exceptions, are purely Welsh.

189. By the Rev. Garnons Williams, rector of Abercwmlais. All the men of fit age that could be met with in a small country parish. ·86 inch and 10·6 lbs. allowed.

190. ·83 inch and 10·1 lbs. allowed. The greater part were inhabitants of or visitors to Bristol, included in my own reports. Colours in 50 :—

Hair.....	Red	Light	Brown	Dark	Black	Total
Eyes, Light	3·5	5·5	7	5·5	1·5	23
„ Neutral	—	1	4·5	3	·5	9
„ Dark.....	1	—	5	6·5	5·5	18
Total	4·5	6·5	16·5	15	7·5	50

* Dr. David Davies, the best native observer, agrees with me in acknowledging these two principal types among the Welsh.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
191.	South Wales (including Monmouthshire)	Patients applying at Bristol Infirmary; mostly with slight ailments	40	5 5·69		142.2	1·6494	60·10
192.	Romney Marsh, Kent	A fair mixture of all classes, in a mainly pastoral district, obtained at cricket-matches and on farms	88	5 7·97		154·9	1·7053	65·72
		Included above—						
		Fair men	7	5 8·36		159·6	1·7152	67·85
		Brown men	28	5 8·21		157·5	1·7114	66·90
		Dark-brown men	15	5 8·13		156·6	1·7094	66·50
		Very dark-brown men	20	5 7·73		152·4	1·6992	64·58
193.	Towns in Kent	Mixed; from various returns	12	5 6·76		145·5	1·6764	61·95
194.	Kent; mostly, if not all, country born	Ditto, ditto	12	5 8·13		157·0	1·7112	66·67
196.	Great Bookham, near Leatherhead, Surrey	Rural population; all classes	30	5 7·33		158·0	1·6875	67·13
		Of these were labourers on one farm	14	5 6·84		154·6	1·6748	65·58
197.	Brighton	Fishermen	13	5 6·80		156·4	1·6761	66·17
198.	Ditto	Fish salesmen	16	5 8·25		156·2	1·7129	66·08

No.	REMARKS.
191.	Observed by myself. ·79 inch and 9·7 lbs. allowed.
192.	By Dr. F. Cock, of London, F.A.S.L., with some additions by W. D. Walker, Esq., of Honeychild Manor. Has every appearance of a fair sample. ·87 inch and 10 lbs. allowed. The colours of 70 are, according to Dr. Cock :—

Hair	Fair	Brown	Dark Brown	Black or very Dark	Total
Eyes, Blue or Grey	6	21	7	7	41
„ Hazel, Brown, etc.	1	7	8	13	29
Total	7	28	15	20	70

The fair men are the largest, the black the least. Dr. Cock, himself a native of, and familiar with, the district, was surprised, on actual enumeration, at the large proportion of dark eyes and hair. The district is peculiar in character, being flat and agueish, and the race is believed to have been little mixed for centuries.

193) 194)	·8 inch and 10 lbs. allowed in each case.
196.	By A. Stedman, Esq., M.R.C.S., Great Bookham. An interesting return. ·93 inch and 10 lbs. allowed. Of 38, the eyes are as follows :—Blue, light grey, 19 ; grey, 4 ; dark grey, 1 ; light hazel, 4 ; hazel, 8 ; dark hazel, 2. The hair is marked dark or black in the majority ; but Mr. Stedman's nomenclature differs much from mine. The excess of dark colours is among the labourers especially. The average circumference of the head is small : in 30, none of whom were of the upper class, it was 22·02 inches, which is much below the average of the north or west of England.
197) 198)	These two returns are by R. P. B. Taaffe, Esq., M.D., of Brighton. ·85 inch and 10·5 lbs. allowed. The fishermen are said to be a separate caste, and a Spanish origin has been ascribed to them. Most of them are returned as dark-haired. I do not know how far the fish-salesmen are the same people : their surnames seem to differ.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
199.	Hurst (near Lewes), Lewes, Uckfield, etc., Sussex	Excavators and other labourers for the most part	51		5 7·72		1·7211	
200.	Swallowfield, South Berkshire, and neighbourhood	Rural population of all classes, taken indiscriminately	65		5 6·98	156·9	1·7023	67·35
201.	Itchen-ferry, near Southampton, fishing village	Fishermen, mariners, and a few tradesmen and artizans	26	5 7·73		163·15	1·6990	68·48
202.	Southampton and Hampshire in general	Miscellaneous population of the town, natives of all parts of Hampshire	14	5 7·94		155·4	1·7063	65·95
203.	Burley, New Forest	Woodmen or forest labourers	16		5 6·30	147·3	1·6850	62·59

No.	REMARKS.
199.	By C. O. Groome Napier, Esq., F.A.S.L. From the class of occupations to which most of the men belong, the average is probably a high one for the county at large.
200.	Except 6 men from my own tables, who yield almost exactly the same average as the rest, the whole are from the report of Nathaniel Crisp, Esq., of Swallowfield, which is very careful and exact, and probably yields a fair average. The men were weighed without shoes, and I have allowed 8·4 lbs. for clothes. Hair and eyes in 42 :—

Hair	Light	Brown	Dark	Black	Total
Eyes, Blue or Grey	9	7	8	—	24
„ Brown	3	6	7	2	18
Total	12	13	15	2	42

Mr. Crisp remarks that wages are good and employment pretty constant in the district, but that milk is a scarcity. Ethnologically, Berkshire is a very "Saxon" county, but Swallowfield is not, probably, the most Saxon part of it. It lies near Silchester.

201.	I owe this return to the kindness of Professor Parkes, of Netley. The Itcheners are a community very little given to intermix their blood with their neighbours; but there is reason to suspect some admixture from the Channel Islands which may have modified the complexions. The heights are pretty exact; the weights mostly only approximate, reputed or conjectural. I allow ·88 in. and 12.15 lbs. for shoes and clothes.

Eyes: Light in 11; Brown or Black in 15.
Hair: Red in 2; Light, 4; Brown, 10; Black (dark ?), 9.

202.	Dr. Bond, of the Hartley Institute, Southampton. ·8 inch and 10 lbs. allowed. The eyes and hair are generally light in Southampton and the neighbouring district of Meon.
203.	By Philip A. Smith, Esq., now one of H. M. Judges in Jamaica. 9·3 lbs. for clothes. This return is very interesting, the population being peculiar in occupation, and quite stationary as to occupation and place. Eyes: Light in 9; dark grey, 2; brown, 5. Hair: Brown in 9; dark, 6; black, 1. The foresters have been thought to differ ethnologically from the rest of Hampshire men, being less Saxon.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
204.	Ringwood, Hants	Miscellaneous; partly agricultural	18	5 7·34		?	1·6900	?
205.	Hampshire	Attendants on the insane in county asylum	13		5 7·25	162·2	1·7091	68·71
205. *bis.*		Miscellaneous, town & country	23	5 7·10		148·6	1·6853	62·86
206.	Hampshire	General averages	110	5 7·46		?	1·6934	
207.	Wooton Basset and neighbourhood, North Wilts	A fair sample of the entire population of a village and rural district	57	5 7·86		162·14	1·7002	68·94
208.	Wiltshire; all parts	Miscellaneous; but not many of middle class; from divers reports, but at least half from my own Bristol tables	45	5 7·60		156·0	1·6977	66·22
209.	Wiltshire; especially the North-west part	Men with slight ailments, applicants at Bristol Infirmary	47	5 6·95		149·9	1·6812	63·45
210.	Gloucester City and Cheltenham town	Miscellaneous; from several reports	15	5 7·01		145·6	1·6827	61·50
211.	Rockhampton and neighbourhood, Vale of Berkeley, Gloucestershire	Rural population (farmers, labourers, etc.)	17	5 6·85		153·4	1·6761	65·04

No.	REMARKS.
204.	By Dr. Dyer, of Ringwood. I allow ·84 inch for shoes. 8 men weighed 153 lbs. on average, but several of the 8 were tall.
205.	By Dr. Manley, Medical Superintendent. 10·7 lbs. allowed.
205. bis.	Abstracted from other reports. ·8 inch and 10 lbs. allowed.
206.	·83 inch allowed.
207.	By Herbert Cooper, Esq., Wooton Basset. A very good report. The district is elevated, with a rather cold but healthy climate; the physical characteristics commonly esteemed, Saxon or Frisian, predominate in the people. I allow ·96 inch and 10·4 lbs. for shoes and clothes. Colours in 58:—

Hair.....	Reddish	Light Brown	Dark Brown	Black	Total
Eyes, Blue or Grey (1 Dk. Grey)	1	20	12	2	35
„ Hazel, etc.....	1	2	15	5	23
Total	2	22	27	7	58

Most of the blacks are doubtless only very dark browns, as really black hair is rather rare in this part of Wiltshire. There is nothing remarkable in the relations of colour and stature.

208.	·8 inch and 10 lbs. allowed.
209.	By myself. ·8 inch and 10 lbs. allowed.
210.	·8 inch and 10 lbs. allowed. Mostly inhabitants of Bristol, and to be compared with No. 216.
211.	By Rev. W. Unett Goates, Incumbent of Rockhampton. ·9 inch and 10 lbs. allowed.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
212.	Wapley, near Sodbury, Gloucestershire	Farmers with their labourers	13	5 8·34		178·0	1.7129	75·97
213.	Hambrook and Winterbourne, South Gloucestershire	Farm-labourers	13	5 6·94		165·7	1·6784	70·62
		Agricultural population—total (2 added)	45	5 7·43		164·7	1·6908	70·16
214.	Westerleigh and neighbourhood, South Gloucestershire	Colliers	27	5 6·92		154·9	1·6753	65·72
215.	Downend, near Bristol, and South Gloucestershire in general	Colliers, about half perfectly healthy; the rest with trivial ailments	55	5 7·47		145·9	1·6893	61·63
		Of these, hereditary colliers	35	5 7·42		147·2	1·6880	62·22
		Ditto, not hereditary	20	5 7·55		143·7	1·6816	60·63
216.	South Gloucestershire	Miscellaneous; but very few of middle class	90	5 7·13		150·9	1·6868	63·91
217.	Parish of Bitton, South Gloucestershire	Labourers; mostly in a chemical factory at Netham, near Bristol	33	5 7·71		146·8	1·6977	62·13
218.	Kingswood, parish of St. George, and other north & east suburbs of Bristol	Miscellaneous; more varied than the last, but half chemical labourers	70	5 6·76		143·4	1.6748	60·50

No.	REMARKS.
212.	By Mr. J. Adams, farmer, of Wapley. ·94 inch and 10½ lbs. allowed.
213.	By Edward Crossman, Esq., M.R.C.S., Hambrook. ·9 inch and 10 lbs. allowed. ·9 inch and 10 lbs. allowed. 7 farmers averaged 5 feet 8·70 inches and 170 lbs. I believe all the three small returns, of which this is a summary, to have been taken quite fairly.
214.	By Messrs. Hewitt and Co., coal-owners, through Mr. Crossman. 1 inch and 10 lbs. allowed.
215.	By D. E. Bernard, Esq., M.R.C.S., Bristol, with a few by Mr. Crossman. 1 inch and 10 lbs. allowed. All these colliery returns are taken with perfect fairness.
216.	·8 inch and 10 lbs. allowed. Almost all inhabitants of Bristol, from my own reports.
217.	·91 inch and 9·8 lbs. allowed. The chemical labourers by P. J. Worsley, Esq.
218.	·86 inch and 9·9 lbs. allowed. The Netham men by Mr. Worsley. The contrast between the Bitton and the St. George's men is noteworthy and curious, as the two parishes march with each other. I am pretty certain that the difference represented does actually exist. Bitton is more rural, St. George's more mining and suburban.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight.	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
219.	South Gloucestershire, including the north and east suburbs of Bristol	Men with slight ailments or injuries, applicants at the Bristol Infirmary	45	5 7·29		155·2	1·6900	65·85
220.	Bristol, city	Miscellaneous. See below—	300	5 6·57		142·4	1·6715	60·05
		Professional men, merchants, manufacturers, clerks	26	5 8·11		152·2	1·7100	64·50
		Shipwrights and wheelwrights	20	5 7·30		148·5	1·6900	62·81
		Corn-porters and hauliers	22	5 8·33		162·8	1·7130	69·30
		Chemical labourers and soap-makers	21	5 5·90		137·7	1·6545	58·05
		Potters	34	5 5·95		136·4	1·6583	57·37
		Clickers	6	5 9·38		138·5	1·7414	58·28
		Other shoemakers	32	5 5·25		128·9	1·6405	54·43
		Ropemakers	15	5 6·01		134·6	1·6570	56·70
		Masons and carpenters	16	5 7·42		152·3	1·6926	64·54
		Tailors	16	5 5·23		122·6	1·6400	51·70
		Smiths and engineers	10	5 5·63		136·1	1·6468	57·20
		Painters	12	5 6·19		140·6	1·6621	59·40
		Millers	8	5 6·62		143·2	1·6723	60·40
		Curriers	6	5 6·31		167·6	1·6646	71·48
		Cabinetmakers	9	5 5·75		133·0	1·6532	56·00
		Bookbinders	6	5 4·30		125·0	1·6164	52·60
		Residue, including shopmen, porters, seamen, tobacco-workers, etc.	41	5 6·86		149·8	1·6789	63·41

No.	REMARKS.
219.	·8 inch and 10 lbs. allowed.
220.	My own report. ·8 inch and 10 lbs. allowed, with slight variations in the several trades. The materials were mostly gotten in the workshops of the several trades, and no selection was made in any case; so that the averages are as fair as the paucity of numbers would allow. I have to acknowledge the assistance of Messrs. W. L. Carpenter, P. J. Worsley, W. Terrell, H. Derham, A. Price, A. Woodward, Wait, Wills, Baker, Fry, Grace, Lucas, Temple, Herapath, Trapnell, and others. The occupation of potters is generally hereditary. The clickers are a superior kind of shoemakers, who work standing.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
221.	Bristol	Volunteers in the Bristol detachment of the Royal Naval Reserve	62		5 5·97	153·3	1·6766	65·00
222.	Elsewhere	Volunteers in the Bristol detachment of the Royal Naval Reserve	43		5 6·65	155·7	1·6939	66·08
223.	Bristol and elsewhere	Volunteer Riflemen	554		5 7·30		1·7104	
		Of whom officers and upper class	45		5 8·06		1·7297	
		Middle class	218		5 7·66		1·7195	
		Lower class	291		5 6·88		1·6997	
223. *bis.*	Bedminster, suburb of Bristol	Colliers, all hereditary	20	5 6·30		156·2	1·6596	66·31
224.	Bath, city	Miscellaneous; chiefly artizans living in Bristol; some professional men	20	5 6·16		138·6	1·6620	58·50
225.	Pill, Pilots' Village, near Bristol, Somerset	Seamen in the Naval Reserve	14		5 6·38	159·4	1·6870	67·76
226.	East (or North-east) Somerset	Miscellaneous; almost all artizans and labourers, living in Bristol	87	5 6·95		146·5	1·6812	61·90

No.	REMARKS.
221.	By Dr. G. Willes, R.N., surgeon superintending the corps, and Captain Smith, R.N., of the Bristol Local Marine Board. 10 lbs. allowed.
222.	By Dr. G. Willes, R.N., surgeon superintending the corps, and Captain Smith, R.N., of the Bristol Local Marine Board. The Naval Reserve are to some extent picked men, unsound and ill-formed men, and even some very short men, being rejected. I have therefore not thrown the Bristolian men into the general average for the city. The strangers show a marked superiority over the native Bristolians.
223.	For this return I have to thank Captain A. M. Jones, Adjutant of the Corps. The division into middle and lower classes, so called, was made merely by separating certain companies, understood to be wholly or mainly composed of artizans, from the rest. The separation is therefore a very rough one. In this, as in all the other returns, men below 23 years of age are excluded. Though there is no minimum standard, it would seem that the artizans in the rifle corps must average an inch or more in stature over the class from which they are taken.
223. *bis.*	By J. R. Bennett, Esq., Bedminster. 1 inch and 10 lbs. allowed. The ancestors of many of these men have been colliers for several generations. Colours in 21 :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Light	—	1	7	1	—	9
„ Neutral	1	—	6	—	—	7
„ Dark	—	—	—	4	1	5
Total	1	1	13	5	1	21

224.	·76 inch and 9·6 lbs. allowed. Mostly from my own observations.
225.	By Dr. G. Willes and Captain Smith. 10 lbs. allowed.
226.	·8 inch and 10 lbs. allowed. Almost all from my own observations.

of birth.	Class of persons observed.	No. of persons.	Average height.		Aver wei
			With shoes.	Without shoes.	
			ft. in.	ft. in.	lb.
t) Somer-	Men with slight ailments or injuries, applicants at Bristol Infirmary	61	5 7·52		148
Somer- ourhood	The members of two friendly societies, consisting of agricultural labourers, small farmers, and the artizans of a rural district	46	5 6·94		150·
	A. Farmers	13	5 7·78		151·3
	B. Agricultural labourers and gardeners	20	5 6·80		150·0
	C. Artizans, etc.	13	5 6·33		147·6
ls) and	Inhabitants of the village of Wookey; labourers, masons,	22		5 6·12	143·2

No.	REMARKS.
227.	·8 inch and 10 lbs. allowed. Observed by myself. Many were inhabitants of Bristol, but many dwelt in neighbouring rural districts.
228.	By Dr. Horace Swete, of Weston-super-Mare. I allow ·84 inch for shoes, and by Dr. Swete's direction only 7 lbs. for clothes; these allowances are slightly varied in the subdivisions. The men are divided pretty equally into light-haired or "sandy" and dark-haired; the former are on an average about 1 inch taller and 11 lbs. heavier than the latter. The return must give a very fair idea of the mass of the population, excluding only the gentry and the larger farmers. The district is half pastoral, half agricultural. Employment is regular, but wages rather low; animal food little used by the labourers, and milk, as is often the case in dairy districts, is seldom procurable. Ethnologically, this is one of the less Keltic parts of Somerset.
229.	By Mr. S. Gooden, carpenter, of Wookey. A very careful and minutely accurate return. 7·2 lbs. allowed for clothes. The colours are given as follows:—

Hair	Fair	Brown	Dark Brown	Black	Total
Eyes, Blue	3	6	2	4	15
„ Grey	1	1	1	1	4
„ Brown	—	2	1	—	3
Total	4	9	4	5	22

	The fair men are by much the tallest and heaviest; the black men very short. The great preponderance of blue eyes is not accidental. At the neighbouring village of Cheddar, similarly situated at the foot of the limestone range of Mendip, I found 40 light, 9 neutral, and 9 dark eyes.
230.	From my own observations. ·8 inch and 10 lbs. allowed.
231.	By myself. ·8 inch and 10 lbs. allowed. These also were all inhabitants of Bristol. 29 shoemakers, half in this and half in the last lot, averaged 5 feet 6·42 inches and 132·1 lbs.

'birth.	Class of persons observed.	No. of persons.	Average height.		Aver weig
			With shoes.	Without shoes.	
			ft. in.	ft. in.	lbs.
Somer-urhood	A mixture of all classes, from a small town and surrounding dairy district in the southern part of the plain of Mid Somerset	20	5 7·17		156·9
West	Yeomen and farmers	18	5 9·33		168·5
eneral	Labourers and artizans; fair sample of lower class	27		5 5·96	
nerset	Men with slight ailments or injuries, applicants at Taunton Hospital	41		5 5·05	133·4

No.	REMARKS.
232.	By John Prankerd, Esq., of Langport. I allow ·82 inch and 10 lbs. for shoes and clothes. Colour of eyes in 25—14 blue or grey, 2 neutral, 9 hazel or brown; of hair, in most, rather light than dark brown. Such colours indicate, I believe, a large proportion of Saxon blood. Mr. Prankerd thinks there is a notable difference in physique, as well as in dialect, between the men to the east and to the west of the river Parret, and that the latter are inferior in size to the former, who have more of what he conceives to be the Saxon type.
233.	By E. Phillips, Esq., M.R.C.S., Bishop's Lydeard, who thinks the sample a fair one of the class. ·93 in. and 11·5 lbs. allowed.
234.	Collected near Taunton by O. Malet, Esq.
235.	By Dr. Edward Liddon, of Taunton, to whom I owe also a return from the Taunton prison. 7·4 lbs. allowed.
236.	By Dr. Gibson, formerly House Surgeon to the Taunton Hospital. ·8 inch and 9·7 lbs. allowed.
237.	By myself. ·8 inch and 10 lbs. See the commentary for an explanation of the discrepancy between the several returns from West Somerset.
238.	By myself. ·8 inch and 10 lbs. The west countrymen fulfil chiefly the more laborious occupations in the city. Very little difference in the West Somerset reports between Taunton and countrymen.
239.	By myself. ·8 inch and 10 lbs. Dark eyes prevail most in the eastern division, dark hair in the western, the middle division is intermediate in both respects.
240.	By myself. Same allowances.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
241.	Gillingham, Dorset, near Wilts and Somerset boundary	Farmers, labourers, and others, of old local descent	28	5 7·16		147·8	1·6850	62·50
242.	Bridport, Dorset	Mixed town population, selected for old local descent	17	5 6·19			1·6620	
243.	North-east Devon: two districts (Sandford and Witheridge)	Purely rural population; mostly farm labourers	33	5 6·80		158·7	1·6748	67·44
244.	North Devon	Mixed; some of upper class; almost all *inhabitants*, but few natives, of towns; from several reports, but mostly from my own, collected in Bristol	65	5 7·57		153·0	1·6964	64·86
245.	North Devon	Mixed; but all of the lower class: persons applying at the Bristol Infirmary or other Hospitals, from slight accidents or trivial maladies	40	5 6·35		153·4	1·6660	65·04
246.	South Devon (excluding Exeter)	Mixed, mostly inhabitants of towns; from sundry reports	49	5 7·25		152·0	1·6888	64·40

No.	REMARKS.
241.	By Dr. E. J. Miles, of Gillingham, through whom also other reports were obtained. Some other Dorset men included, who do not, however, affect the averages notably. ·86 in. and 10 lbs. allowed. Colours in 28 :—

Hair	Red	Light	Brown	Dark	Black	Total
Eyes, Blue, Light Grey ...	1	5	6	4	3	19
„ Neutral	—	1	—	3	—	4
„ Brown	—	—	1	1	3	5
Total	1	6	7	8	6	28

These proportions are curious, but agree pretty nearly with my own observations. Black hair is very common. The whole neighbourhood, lying south-west of *Mere*, a Saxon boundary, probably retained its aboriginal population but little crossed.

242. By the Rev. J. Lettis Short, of Sheffield, author of the reports from that town. ·79 inch allowed. Grey eyes and dark brown hair prevail, with low brows; aquiline noses rare. Heads of good size (circumference 22·65 inches).

243. By Mr. Treble, for C. B. Cornish-Browne, Esq., of Sandford. ·9 inch and 10 lbs. allowed. Eyes mostly grey; hair in 39—2 red, 7 light, 12 brown, 12 dark brown, 6 black. The light and brown men almost all from Sandford, and the black from Witheridge, which is near the Keltic district of Exmoor. The dark brown men are the largest. The great weight, in comparison with their apparent size, is characteristic of the Devon peasantry. "They are little men, but they weigh like lead," said to me a local anthropologist.

244. Chiefly by myself. ·82 inch and 10 lbs. allowed. The weight is depressed by the presence of a large number of tailors (from the Bristol report), and the height elevated by that of several policemen and professional men.

245. Mostly by myself: some at Taunton Hospital by Drs. Liddon and Gibson. ·8 inch and 10 lbs. allowed.

246. Mostly by myself; but there is included part of a report by Dr. C. Pridham, of Paignton, consisting of country folk, miners and seamen. ·8 inch and 10 lbs allowed.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
247.	Exeter	Ditto, ditto	14	5 6·27		137.5	1·6647	57·83
248.	South Devon, with Exeter	Mixed, but all lower class; persons applying at Bristol Infirmary & Plymouth Hospital	27	5 6·21		142·6	1·6624	60·14
249.	Brixham, Torbay	Fishermen and seamen	15	5 6·40		?	1·6672	?
250.	Devon, especially the neighbourhood of Tavistock	Miners employed near Tavistock	32	5 8·06		164·3	1·7043	69·53
251.	Cornwall; all parts	Ditto, ditto	28	5 8·25		166·3	1·7091	70·43
252.	Fowey, Tywardreath, and neighbourhood, East Cornwall	Miners (tin, etc.)	22		5 8·90	163·7		69·25
253.	Ditto, ditto	Mixed, but chiefly labourers: some tradesmen	20		5 8·13	166·0		70·30

No.	REMARKS.
247.	As the last: observed in Bristol.
248.	By myself, with additions by Dr. G. Miles, of Plympton. ·8 inch and 10 lbs.
249.	By the Rev. J. R. Nankivell, Chaplain to Torbay Mission to seamen, with additions by myself. ·8 inch allowed. The Brixhamites, unlike many communities of fisherfolk, seem to be, so to say, indigenous. They are a rather small, dark-haired race.
250 251	This and the next report (251) are by the Rev. A. N. Blatchford, of Bristol. 1 inch and 11 lbs, allowed. The men were taken fairly; but it is clear that the miners as a class surpass the agricultural population of Devon. The people about Tavistock no doubt approach the Cornish in type; nevertheless, the latter, as here represented, have slightly the advantage in size, and are also darker in colour of both eyes and hair. Compare these and the next returns with those from Wanlockhead, Leadhills, Allenheads, Wharfedale, and Cardiganshire (Nos. 52, 53, 89, 184-5). Dr. Barham, of Truro (Children's Employment Com. Report), found the following average weights in several squads of miners:—Devon, 153·5 lbs.; East Cornwall, 161·1 lbs.; Central Cornwall, 157·6 lbs.; West Cornwall, 151·2 (these last were all weighed on coming up from the pit, which makes a difference of about 7 lbs.!) The whole number of men weighed was 242, the ages were from 20 to 30, and would probably yield a slightly lower average than 23 to 50, the ages in Mr. Blatchford's and Dr. Davis's reports.
252.	This and the next report are by Dr. Arthur Davis, of Fowey. In some instances, Dr. Davis says, he accepted the statements of the men as to their heights, and the average has perhaps been unduly raised thereby. The weight is generally exact to a pound. 11 lbs. allowed for clothing.
253.	As the last. In the two reports: Eyes—11 blue, 10 grey, 6 dark grey, 15 brown. Hair—3 red, 9 fair, 12 brown, 9 dark, 9 black. There is no particular relation of stature to colour, when Dr. Davis's and Mr. Blatchford's returns are thrown together.

birth.	Class of persons observed.	No. of persons.	Average height.		Average weight
			With shoes.	Without shoes.	
			ft. in.	ft. in.	lbs.
Corn-	Mostly miners and labourers, being the choir, Sunday-school teachers, and adult class of the parish	23	5 7·92		161·1
	A mixture of all classes, but especially miners and engine-tenders, from divers reports	21	5 7·34		160·7
rhood	4 merchants; 19 men employed in the quarries and stone works of R. Hosken, Esq.	23	5 8·42		158·8
	Workmen alone	19	5 8·25		158·2
	General population; mostly at	25		5 [illegible]	[illegible]

No.	REMARKS.
254.	By the Rev. Francis Wright, Vicar of St. Stythian's, for Dr. Barnard Davis, F.R.S. (*Cran. Brit.*, decad. vi, p. 202). ·87 inch and 11 lbs. allowed. Mr. Wright thought the sample a fair one. The extremes were 5 feet 4 inches and 5 feet 10½ inches. The circumference of head averaged 22·7 inches, which is large.
255.	By several observers. ·84 inch and 10·4 lbs. allowed. The average of height is lower than I should have expected.
256.	I owed this return to the late R. Hosken, Esq., of Penryn. The sample was a fair one, taken as the men came for their wages. ·92 inch and 10·5 lbs. allowed. No particular relation of stature to colour, except that the brown-haired men were taller than the rest.
257.	These two valuable returns were made separately at different times by J. Grenfell Moyle, Esq., Scilly, at the instance of Dr. Davis and myself. They probably yield a very fair sample of the population. In the second case I allow ·95 inch for shoes, and in both 11·1 lbs. for clothing. The colours of eyes and hair in 65 men were, according to Mr. Moyle:—

Hair	Light	Brown	Dark	Black	Total
Blue Eyes	11	9	7	—	27
Grey Eyes	—	6	4	—	10
Dark Eyes	—	1	11	4	16
Black Eyes	—	—	8	4	12
Total	11	16	30	8	65

The black and dark-haired in both returns were conspicuously (about 2 inches) taller than the fair and brown-haired (*Crania Britannica*, decade vi.) Tradition, history, and the family names indicate that the population is not exclusively of Cornish origin; some old families seem to have come from Devon, and even from Wales.

NATIVES OF IRELAND.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
258.	Ireland; all parts, but in large proportion Munster	Miscellaneous, but with hardly an exception of the lower class, from a great number of reports	59	5 7·00		147·3	1·6824	62·45
259.	Munster, especially co. Cork	Applicants at the Bristol Infirmary, with accidental or slight ailments	40	5 6·63		146·6	1·6748	62·36

No.	REMARKS
258.	·8 inch and 9·6 lbs. allowed. These are all the Irishmen who occur in the reports from England, Scotland, and Wales. Nearly half are from my own Bristol reports.
259.	By myself. ·73 inch and 9·1 lbs. allowed. Colours in 45 :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Light	1	3	11	14	—	29
„ Dark Grey	1	—	—	2·5	2·5	6
„ Hazel or Brown ...	—	—	2·5	4·5	3	10
Total	2	3	13·5	19	5·5	45

NATIVES OF SCOTLAND.—LUNATICS.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
260.	Shetland	Lunatics in fair bodily health, not including idiots	6		5 6·63	145.6	1·6934	62·41
261.	Caithness	Ditto, ditto	11		5 6·80	145·5	1·6977	62·36
262.	Inverness, Nairn, Ross, and Sutherland (mainland)	Ditto, ditto	70		5 6·99	146·6	1·7025	62·68
263.	Inverness and Ross (islands) (Northern Hebrides)	Ditto, ditto	16		5 5·98	146·8	1·6768	62·77

No.	REMARKS.
260.	In the Montrose Royal Asylum. By Dr. James Howden, Medical Superintendent, and Dr. Addison. 8 lbs. allowed for clothes, by Dr. Howden's direction. All dark-haired, with one exception. See remarks on No. 261, and on the return from Inverness Asylum.
261.	Also at Montrose. 8 lbs. allowed for clothes.
262.	By Dr. Thomas Aitken, Member of the Anthrop. Soc. of Paris, and Superintendent of the Inverness District Asylums. The return is very minute and accurate, as indeed are all those I have from Scotch Asylums. Average weight of clothes 8·4 lbs.
263.	Also by Dr. Aitken. Clothes 8·4 lbs. The striking difference in stature between the mainland Highlanders and the Hebrideans, while their average weights are about the same, is confirmatory of other statements on the subject. These lunatics are mostly from Skye; the Uist men (see Nos. 6, 7, 8) are taller. There are diversities also in complexion, red and black hair being commoner on the mainland, brown shades in the isles. Dr. Aitken gives the following as the colours of the eyes and hair in 86 lunatics (70 mainlanders and 16 islanders):—

	Hair.....	Red	Fair	Brown	Dark	Black	Total
Mainland.	Eyes, Light	2	12	9	13	2	38
	„ Dark Grey	—	2	5	8	2	17
	„ Brown	—	3	4	4	4	15
	Total	2	17	18	25	8	70
Islands.	Eyes, Light	—	2	—	6	—	8
	„ Dark Grey	—	—	—	3	—	3
	„ Brown	—	—	1	3	1	5
	Total	—	2	1	12	1	16

I owe to Dr. Aitken some valuable observations on the relation of the colour of the hair to various forms of insanity, which I propose to publish elsewhere.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
264.	Argyle (islands) (Southern Hebrides)	Ditto, ditto	10		5 5·85	144·9	1·6735	62·14
265.	Argyle (mainland)	Ditto, ditto	27		5 7·59	150·6	1·7180	64·40
266.	Perthshire (Highlands)	Ditto, ditto	15		5 6·38	151·4	1·6870	65·38
267.	Perthshire (Lowlands)	Ditto, ditto	41		5 6·52	147·8	1·6906	63·75
268.	Angus	Ditto, ditto	26		5 6·35	141·3	1·6862	60·46

No.	REMARKS.
264.	This and the next return are by Dr. Sibbald, of the Argyle Asylum, Lochgilphead. I allow 7·9 lbs. for clothes in this case, and 8·6 lbs. in the next.
265.	Dr. Sibbald. The islanders are shorter than the mainlanders, as was the case further north. Colours in 40 :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Light	1	5	13	3	4	26
„ Dark Grey	—	—	3	1	4	8
„ Brown	—	1	1	—	4	6
Total	1	6	17	4	12	40

The fair men, and those with grey eyes and dark or black hair, are larger than the rest.

266. By Dr. C. Macintosh, of the Perthshire Asylum, Murthly. Distributed among this and some of the following numbers are some inmates of the Murray Royal Institution, Perth, from a return by Dr. Lauder Lindsay, F.L.S. Clothes weigh 7¼ lbs. according to Dr. Macintosh.

267. Dr. Macintosh. Clothes 7¼ lbs. The slight differences between the Perthshire Highlanders and Lowlanders probably correspond to those prevailing in the same population. There are differences also in colour of hair, not wholly accidental, as I think.

	Red	Fair	Brown	Dark	Black	Total
Highlanders	—	4	3	4	4	15
Lowlanders	5	6	12	13	5	41

268. This, like the Shetland and Caithness returns, is by Dr. James Howden, of the Montrose Asylum. ·2 inch allowed for slippers. The clothes weighed 8 lbs. See Dr. Howden on the weight of lunatics in his report for 1867.

By Dr. T. Howden, Superintendent of the Haddington Asylum. 7·8 lbs. allowed for clothes.

irth.	Class of persons observed.	No. of persons.	Average height.		Avera weigh
			With shoes.	Without shoes.	
			ft. in.	ft. in.	lbs.
sin of	Ditto, ditto	22		5 7·67	145·0
	Ditto, ditto	36	5 7·27		147·3
	Ditto, ditto	9	5 7·11		146·6
	Ditto, ditto	16		5 6·49	155·7
	Ditto, ditto	36			

No.	REMARKS.
270.	By Dr. S. Grierson, Superintendent. 8·1 lbs. allowed for clothes. These men surpass in stature those included in any other return. Most of them are set down by Dr. Grierson as having blue eyes and fair or light-brown hair.
271.	By Dr. Gilchrist, Superintendent of the Crichton Institution and of the Southern Counties Asylum, and Dr. Munro, Assistant Medical Officer. Part of a large return. Clothes average 8 lbs. Hair generally light or brown.
272.	Upper and middle class lunatics, chiefly from the Murray and Crichton Institutions. ·76 inch allowed for shoes, and 9·66 lbs. for clothes.
273.	Mostly from the Glasgow Royal Asylum, Dr. Alex. Mackintosh, Superintendent, or from the Crichton Institution. Several of the upper class, and one or two corpulent men, are included. Dr. Mackintosh sets down the weight of clothing at 13 lbs. I have taken the average at 12·2 lbs.
274.	From different returns, from English as well as Scottish Asylums. 8·6 lbs. allowed for clothes.

NATIVES OF ENGLAND.—LUNATICS.

of birth.	Class of persons observed.	No. of persons.	Average height.		Av we
			With shoes.	Without shoes.	
			ft. in.	ft. in.	
	Lunatics in fair bodily health; idiots and congenital imbeciles being excluded	6		5 8·2	14
	Ditto, ditto	48		5 6·60	151
	Ditto, ditto	9		5 8·11	160
	Ditto, ditto	30			

No.	REMARKS.
275.	Dr. H. Grainger Stewart, Medical Superintendent Newcastle Borough Asylum. Clothing estimated at 8·9 lbs.
276.	With few exceptions, from the Cumberland and Westmoreland Asylum, and by Dr. T. S. Clouston, Medical Superintendent. I estimate the clothing at 9·2 lbs. Of 49, 35 light and 14 dark eyes; of 48, 10 fair, 7 brown, 31 dark hair.
277.	All from Dr. Clouston. Estimate clothing at 9.5 lbs. The largest men met with in any asylum, but of course the number is too small. Of 10, 6 light eyes, 2 fair hair. On the whole, taking the two counties together, fair men are taller, but lighter than others.
278.	Dr. Robert Smith, Medical Superintendent Durham County Asylum. I allow 8·5 lbs. for clothes. The return includes all the lunatic natives of the county who answered the conditions. Eyes and hair rather light on the whole.
279.	Dr. T. B. Christie, Medical Superintendent North Riding Asylum, and Mr. Chaffer, Assistant Medical Officer. 10 from each division. The weight is given without clothing. The North Riding men are by much the bigger, but I have not separated them, the numbers being so small. Eyes, 6 light grey, 7 dark grey, 2 light brown, 5 brown; hair, 6 light, 8 brown, 6 dark. Neutral eyes are singularly common in most parts of Yorkshire (see the returns from the same population).
280.	24 of these are from the great Lancaster Asylum, by Dr. Niel Gray Mercer, 2nd Medical Officer (Mr. Broadhurst, Medical Superintendent); the remainder from sundry other reports, including some upper class men from Dumfries Asylum, who raise the average a little. 8·7 lbs. allowed for clothing. 5 men with Irish names average only 5 ft. 4·7 inches and 138·6 lbs. The red and fair men are notably taller than the dark.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
281.	Hull	Ditto, ditto	17		5 5·54	140·8	1·6656	60·32
282.	Nottingham : town and suburbs	Ditto, ditto	18		5 4·68	132·9	1·6438	56·92
283.	Ditto, villages and small towns	Ditto, ditto	18		5 6·22	143·3	1·6830	61·46
284.	Derbyshire	Ditto, ditto	29	5 6·01		148·6	1·6583	62·59
285.	Cheshire	Ditto, ditto	22	5 6·38		150·2	1·6680	63·50
286.	Staffordshire	Ditto, ditto	26		5 6·23	151·3	1·6882	63·74

No.	REMARKS.
281.	F. W. Casson, Esq., Medical Superintendent Hull Borough Asylum. The return included, I believe, all the available inmates, of whom 17 were natives of Hull. 7·8 lbs. allowed for clothes. Great prevalence of light eyes and hair, especially when the Hull men are compared with inmates who belong to other districts. Hair, red 1, light-brown 8, brown 4, dark-brown 4, black 0.
282 283	Dr. W. P. Stiff, Medical Superintendent Nottingham County and Borough Asylum. 7·4 and 7·8 lbs. allowed for clothes. Note the great difference in the size of the town and country born men, indicating degeneracy in the former. Eyes and hair on the whole more often dark in the former than in the latter.
284.	Dr. Hitchman, Medical Superintendent Derby County Asylum. ·71 inch for shoes, and 10·6 lbs. for clothes. In 30—Eyes, 4 blue, 7 blue-grey, 2 light grey, 10 grey, 1 dark grey, 1 light brown, 5 brown; Hair, 2 red, 13 light brown, 3 brown, 10 dark brown, 2 black. The light-haired men are much taller and heavier than the dark; and the townsmen, who are few, surpass the rest.
285.	Dr. Harper, Medical Superintendent Cheshire Asylum. ·75 inch for shoes, and 10·2 lbs. for clothing. Light or grey eyes prevail, with brown hair.
286.	Mark Noble Bower, M.D., Medical Superintendent County Asylum, Stafford. Very exact. Clothes, 12·3 lbs., as allowed by Dr. Bower.

Hair	Light Brown	Brown	Dark Brown	Black	Total
Eyes, Blue, Light Grey	3	4	5	—	12
„ Dark Grey and Light Brown...	—	2	5	1	8
„ Brown	1	—	3	2	6
Total	4	6	13	3	26

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight.	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
287.	Leicestershire and Rutland	Ditto, ditto	53		5 6·75	148·0	1·6812	63·50
288.	Warwickshire—	Ditto, ditto						
	A. Birmingham		12	5 5·66		137·3	1·6496	58·05
	B. Other towns		19	5 5·56		141·2	1·6470	59·82
	C. Country		19	5 6·59		152·6	1·6733	64·68
	D. Total		50	5 5·98		144·7	1·6578	61·23
289.	Norwich	Ditto, ditto	17		5 5·09	141·88	1·6542	60·77

This counter-changing of colours is certainly common in Stafford, as in Devon and parts of Wales, and North Lancashire. M. Guibert, in his valuable paper on the Anthropology of Bretagne, takes it to be an indication of the mixture of uncomformable races. I have myself observed some facts consistent with this view.

287. John Buck, Esq., Medical Superintendent Leicestershire and Rutland Asylum. I allow 8 lbs. for clothes.

Hair ..... Light Brown	Brown	Dark Brown	Black	Total
Eyes, Blue and Grey 6	7	4	1	18
„ Dark Grey 2	2	4	1	9
„ Brown, etc. 2	5	7	12	26
Total 10	14	15	14	53

Darkness of eyes remarkable; agrees with other returns from Leicester. Brown and dark brown men bigger than the two extremes; the fair the smallest.

288. By T. Green, Esq., Medical Superintendent Birmingham Borough Asylum, and Dr. Parsey, Medical Superintendent, and Dr. Snell, Assistant Medical Officer, Warwick County Asylum. I allow ·75 inch for shoes, and 9·3 lbs. for clothes in the first two instances, and 10·6 lbs. in the third. The dark-haired men are much bigger as a rule, at least in the county, though not in Birmingham. Colours of hair in the three—

Hair	Red	Fair	Brown	Dark or Black
Birmingham	1	2	1	8
Towns.....	—	6	5	8
Country	—	1	6	12

Of the Birmingham men, 3 have brown eyes; of the townsmen, 5; of the countrymen, 11. In this case, I believe the influence of race to be traceable. A dark-eyed and often dark-haired race occupies great part of Leicestershire, Warwickshire, and Northamptonshire—the most central portion of England.

289. F. Sutton, Esq., Medical Superintendent Norwich Asylum. 7·88 lbs. allowed for clothes.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
290.	Norfolk, country	Ditto, ditto	20	5 7·65		162·6	1·7002	68·94
291.	Cambridgeshire	Ditto, ditto	19		5 6·76	149 ?	1·6967	63·50
292.	Suffolk	Ditto, ditto	51	5 6·71		145·3	1·6763	61·68
293.	Bucks	Ditto, ditto	25	5 6·13		143·2	1·6598	60·77
294.	Worcestershire	Ditto, ditto	29	5 7·28		158·5	1·6908	67·12
295.	Gloucestershire	Ditto, ditto	20	5 6·35		159·8	1·6672	67·80

No.	REMARKS.
290.	Dr. W. C. Hills, Medical Superintendent Norfolk Asylum. I allow ·75 inch for shoes, and 10·6 lbs. for clothes. Striking difference in size between town and country, but in colour not much difference. In 45—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	1	10	10	5	2	28
„ Light Brown, etc.....	—	1	4	3	—	8
„ Dark Brown	1	1	2	4	1	9
Total	2	12	16	12	3	45

291. Dr. C. Mackenzie Bacon, Medical Superintendent Cambridge County Asylum. The average weight was 143 lbs. without coat, waistcoat, or shoes, or probably 140 lbs. naked. Mostly grey-eyed and brown-haired. 6 townsmen, Cambridgeshire, Ely, and Wisbech, average only 5 feet 4·44 inches.

292. Dr. John Kirkman, Medical Superintendent Suffolk County Asylum. ·75 inch for shoes, and 9·3 lbs. for clothes. A good deal of dark hair. Average of 16 farm labourers only 5 feet 6·25 inches and 141·8 lbs.

293. John Humphry, Esq., Medical Superintendent County Asylum, Aylesbury. ·75 inch for shoes, and 9·2 lbs. for clothes. Light men much taller and heavier than dark. 8 agricultural labourers average 5 feet 4·97 inches and 141·4 lbs.; 5 of them dark-haired.

294. Dr. Sherlock, Medical Superintendent City and County Asylum. ·75 inch for shoes, and 10·5 lbs. for clothes. Fair men rather taller and lighter than others.

295. E. Toller, Esq., Medical Superintendent County Asylum. Note the great weight of the men. 9 of 20 brown-eyed. ·75 inch for shoes, 10·3 lbs. for clothes.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
296.	Bristol	Ditto, ditto; inmates of asylum, but birthplaces not noted	47		5 5·41	143·3	1·6432	60·55
297.	Shrewsbury (town)	Ditto, ditto; nativity ascertained	10		5 7·05	141·6	1·6840	59·69
298.	Salop (county)	Ditto, ditto	23		5 6·0	147·9	1·6608	62·54
299.	Montgomeryshire	Ditto, ditto	19		5 5·67	150·2	1·6499	63·59
300.	North Wales, except Montgomeryshire	Ditto, ditto	40		5 5·82	150·7	1·6537	63·82
301.	Herefordshire	Ditto, ditto	22		5 6·18	150·4	1·6830	63·59
302.	Monmouthshire and Breconshire	Ditto, ditto	43		5 5·50	143·5	1·6646	61·44

No.	REMARKS.

296. Dr. H. Stephens, Medical Superintendent Bristol City Asylum. Birthplaces not distinguished, but probably the great majority are of Bristolian birth. ·75 inch and 9·8 lbs. allowed for shoes and clothing. Colours in 50—

	Red	Light	Brown	Dark	Black	Total
Blue or Grey.....	3	6	4	7	1	21
Brown or Dark.....	2	6	11	9	1	29
Total	5	12	15	16	2	50

Sizes: dark tallest, then fair, then brown.

297 } Both by H. Rooke Ley, Esq., Medical Superintendent Salop and Montgomery Asylum. ·75 inch and
298 } 10 lbs. allowed for shoes and clothing. The comparative tallness of the townsmen is contrary to rule; but the numbers are too small to be of much importance.

299. Also by Mr. H. R. Ley. ·75 inch and 10 lbs. allowed.

300. G. Turner Jones, Esq., Medical Superintendent North Wales Asylum, Denbigh. ·75 inch and 10 lbs. Colours in all North Wales (59) :—

Hair	Red	Light	Brown	Dark	Black	Total
Eyes, Blue or Grey.....	1	6	15	1	—	23
„ Light Brown.....	1	1	1	—	—	3
„ Brown, etc.....	—	6	14	11	2	33
Total	2	13	30	12	2	59

The dark men are small, the fair medium, the brown biggest. No doubt the "light" here include what I call brown, the "brown" including most of the dark shades of brown.

301 } Dr. D. McCullough, Medical Superintendent Abergavenny Joint Counties Asylum, and Dr. Chapman,
302 } Assistant. Includes all in the asylum answering the conditions. I allow 8 lbs. for clothing. Nothing remarkable in colours. Light men rather small.

ı.	Class of persons observed.	No. of persons.	Average height.		Ave we
			With shoes.	Without shoes.	
			ft. in.	ft. in.	
	Ditto, ditto	50	5 5·43		11
	Ditto, ditto	21	5 7·17		11
	Ditto, ditto	17	5 6·56		11
	Ditto, ditto	14	5 6·39		11
		204		5 5·29	11
		107		5 4·36	13

No.	REMARKS
303.	Dr. D. Yellowlees, Medical Superintendent County Asylum, Bridgend. ·75 inch allowed for shoes, and 9·4 lbs. for clothing.
304 305 306	Dr. C. J. Hearder, Medical Superintendent Joint Counties Asylum, Caermarthen. ·75 inch allowed for shoes, and 10 lbs. for clothes. The Caermarthen men are light-eyed, with hardly an exception, but this is, I think, accidental. The biggest men are dark brown, the fair and black both fall considerably below the average.
307.	9·42 lbs. allowed here for clothing.
308.	The greater part of these are from the report of H. W. Jackson, Esq., Assistant Medical Officer Surrey County Asylum (J. Biggs, Esq., Medical Superintendent). To these are added Londoners, from the reports of Dr. Sheppard of Colney Hatch; of Dr. Jepson and Mr. Hullah of the City of London Asylum; and of Dr. W. Hunt of the Hoxton Asylum, with a few stragglers. I allow 7·8 lbs. for clothing. Colours in 108:—

Hair	Red	Light	Brown	Dark	Black	Total
Blue or Grey	2	10	26	10	1	49
Dark Grey or Light Brown	—	1	12	3	—	16
Brown or Dark	1	2	8	29	3	43
Total	3	13	46	42	4	108

These figures probably nearly correspond to those of the ordinary population. The number of brown eyes is noticeable. The low average of stature pervades all the returns from which this item is compiled. There is no peculiarity in the relation of stature to colour.

309.	H. W. Jackson, Esq., F.A.S.L. (see above). In 10 of these both hair and eyes are dark. I allow 8·3 lbs. for clothing.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
310.	Kent		59	5 7·06		163·8	1·6852	69·30
311.	Sussex		82	5 6·35		149·28	1·6672	63·50
312.	Hampshire		66		5 5·30	144·2	1·6596	62·14

No.	REMARKS.

310. 48 of these are from the Kent County Asylum. Dr. W. P. Kirkman, Medical Snperintendent, Mr. Spencer, Assistant Medical Officer. Their averages are 5 feet 7·40 inches and 170·5 lbs.; both remarkably high, but I am assured the sample is a fair one. It would be difficult in some asylums to pick 48 men equal to these. Dr. Kirkman's dietary is certainly a very liberal one. I allow ·75 inch and 11 lbs. for shoes and clothing. The frequency of eyes of brownish hue, which is notable in London and other parts of the south-east, reappears here. Mr. Spencer divides his 48 thus: Eyes—12 blue, 13 grey, 12 hazel, 1 dark, 5 brown, 5 black; Hair—8 light, 6 light brown, 20 brown, 17 dark, 7 black, and of the whole 59 only 32 have light eyes. On the average the light men are the tallest, though the largest man is black. 9 agricultural labourers average only 5 feet 6·83 inches.

311. Dr. C. Lockhart Robertson, Medical Superintendent Sussex County Asylum. Includes all the men suitable for my purpose. ·75 inch and 9·3 lbs. allowed.

Hair	Red	Fair	Light Brown	Dark Brown	Black	Total
Eyes. Blue or Grey ...	1	13	15	8	1	38
„ Hazel.....	—	1	6	31	6	44
Total.....	1	14	21	39	7	82

Relation of stature to size not very striking. The fair men are short and the black tall and heavy; the light brown above and the dark brown below the average.

312. By Dr. Manley, Medical Superintendent Hants County Asylum. Includes all the men suitable. 7·2 lbs. for clothes. Colours :—

	Red	Fair or Light Brown	Brown	Dark and Black	Total
Blue, Grey, etc.	2	15	4	6	27
Hazel	1	5	3	3	12
Brown, etc.....	—	2	4	12	18
Total	3	22	11	21	57

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
313.	Wilts		89		5 5·29	143·3	1·6593	61·27
314.	Dorset		28	5 6·60		152·14	1·6735	64·81
315.	Somerset		27	5 5·68		151·2	1·6512	63·95

No.	REMARKS.

The great proportion of hazel or dark eyes continues. The light men are smaller than the others. 15 Southampton, Winchester, and Portsmouth average 5 ft. 5·31 in., 144·8 lbs.

313. This return I owe to Dr. Thurnam, Medical Superintendent Wilts County Asylum, etc. It includes all the inmates suitable. Dr. T. has favoured me with much other valuable information, to be utilised elsewhere. 8·2 lbs. for clothes. Colours in 89 :—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Light	—	18	28	1	1	48
„ Neutral	1	5	16	3	6	31
„ Dark	—	—	2	3	5	10
Total	1	23	46	7	12	89

The dark brown men are tallest; the black men least.

314. Dr. J. C. Symes, Medical Superintendent Dorset County Asylum. ·75 inch allowed for shoes and 9·4 lbs. for clothes, by Dr. Symes's direction. Colours of hair and eyes :—

Hair	Red	Fair	Brown	Dark	Black	Total
Blue or Grey	1	2	6	3	—	12
Dark Grey, etc.	—	—	2	5	—	7
Brown	—	—	2	5	2	9
Total	1	2	10	13	2	28

The brown-haired men average 5 feet 7·2 inches.

315. Dr. Henry Bath, Assistant Medical Officer Somerset County Asylum (Dr. Medlicott Medical Superintendent). ·75 inch and 10·2 lbs. allowed for shoes and clothes, by Dr. Bath's direction. Average of 10 born in towns, 5 feet 5·12 inches and 141·7 lbs.; average of 15 born in rural districts, 5 feet 5·55 inches and 155·4 lbs. In 26, colour of hair and eyes :—

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
316.	Devon, East		23		5 4·64	148·3	1·6428	63·63
317.	Devon, North		38		5 4·80	146·9	1·6468	63·00
318.	Devon, South		32		5 4·73	144·5	1·6450	61·90
319.	Exeter		12		5 4·73	142·3	1·6450	60·91
320.	Plymouth and Devonport		19		5 5·21	151·1	1·6573	64·90
321.	Devon—total		125		5 4·78	146·68	1·6464	62·90
322.	All Ireland		33	5 6·44		146·03	1·6685	62·05

No.	REMARKS.

	Fair or Light Brown	Brown	Dark	Black	Total
Blue or Grey	9	5	2	—	16
Dark Grey	—	1	2	—	3
Brown	1	—	3	3	7
Total	10	6	7	3	26

The light-haired men are taller than the dark-haired. The return includes two or three very heavy men.

316 317 318 319 320 321 Dr. C. J. Saunders, Medical Superintendent Devon County Asylum. Dr. S. having kindly sent me particulars of his whole available population, I have divided them according to districts. East Devon comprehends the country east of Exeter. North Devon is, roughly speaking, the country north of Dartmoor. The natives of Devon are, as a rule, short and thick-set. The averages show no decline in the stature of the few men from Exeter, and an increase in Plymouth. This may perhaps be accounted for in both cases by admixture of blood. The people of Plymouth are to a great extent of Cornish descent; and the Cornish are generally taller than the Devonians. I have allowed 8 lbs. for shoes.

The relations of stature to colour are not very clear, but the black-haired men are very short, the dark brown and the brown taller, and the fair rather short.

322. Collected from all the English and Scotch Asylum Reports. ·79 inch allowed for shoes, and 9·23 lbs. for clothes. In 25 of the 33 the eyes are light, the hair being almost always brown or dark.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight.	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
323.	Scotch Highlanders	Convicts in General Prison at Perth	15		5 8·5	154·0	1·7400	65·31
324.	Scotchmen (not known to be Highlanders)	Ditto, ditto	319		5 6·88	151·5	1·6987	64·18
325.	Englishmen	Ditto, ditto	55		5 6·23	149·1	1·6822	63·10
326.	Irishmen	Ditto, ditto	110		5 6·65	147·7	1·6929	62·45
327.	Almost all Englishmen; mostly from Yorkshire and other northern and midland counties	Convicts in Wakefield Prison	254		5 5·67	144·1	1·6680	60·82
328.	Six large towns in Yorkshire	Wakefield convicts, included above	23		5 5·26	143·2	1·717	60·41
329.	Rest of Yorkshire	Ditto, ditto	46		5 6·58	147·3	1·6911	62·28

323 James Bruce Thomson, Esq., Medical Superintendent of the Prison, through Professor Christison. The
324 men were measured without shoes, but weighed with them; for this I allow 10 lbs. Colour of eyes and hair in
325
326

	Eyes Blue or Grey.						Eyes Hazel or Brown.				
	Red	Fair	Brown	Dark	Black		Red	Fair	Brown	Dark	Black
303 Scotch	13	40	117	32	26	...	—	3	37	14	21
15 Ditto Highlanders	—	1	10	2	—	...	—	—	1	1	—
95 Irish	5	10	34	8	13	...	2	1	12	2	8
51 English	4	4	20	2	3	...	—	—	10	2	6

These figures develope to some extent the national tendencies with respect to colour, *e. g.*, the comparative frequency of dark eyes among the English, of fair hair among the Scotch, and of the combination of light eyes with black hair among the Irish.

327. By the late W. R. Milner, Esq., Medical Officer of the Prison, whose own observations on the dietary and weight of prisoners are well known. He found the weight of the prison clothes to average 10 lbs., or a fraction less; I therefore allow 10 lbs. Colours in 259:—

Hair	Red	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	10	31	77	32	2	152
„ Neutral	—	1	1	6	2	10
„ Hazel, Brown, etc.	5	6	40	37	9	97
Total	15	38	118	75	13	259

328 The colours in 65 are given as follows:—
329

	Red	Fair	Brown	Dark	Black	Total
Eyes, Blue or Grey	2	9	27	4	2	44
„ Hazel or Brown	—	—	13	8	—	21
Total	2	9	40	12	2	65

Thus the Yorkshiremen are conspicuously lighter in hair-colour than the other convicts, but the difference is less marked with respect to the eyes. This accords with my own observations.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
330.	Unknown: probably in most cases Lancashire or Ireland	Prisoners in Liverpool Jail, aged 23 to 30	1118	5 6·33		143·2	1·6654	60·41
330. *bis.*	Manchester and Liverpool	Mostly from Wakefield; a few from other prisons	37		5 4·97	136·8	1·6503	57·51
331.	Cheshire and Lancashire, excluding Manchester and Liverpool	From Wakefield	31		5 5·37	143·4	1·6604	60·50
332.	Nottingham town	Mostly from Wakefield	11		5 6·02	142·4	1·6770	60·05
333.	Lincolnshire, Notts, and Derbyshire	Ditto, ditto	16		5 6·01	144·0	1·6767	60·78
334.	Durham and other northern counties	Ditto, ditto	15		5 5·73	143·0	1·6695	60·32
335.	Staffordshire	Ditto, ditto	16		5 5·18	147·3	1·6555	62·28
336.	Salop	Prisoners, mostly from Shrewsbury Jail, with some from Wakefield	44		5 5·43	142·5	1·6619	60·10
337.	Birmingham	From Wakefield	25		5 5·20	141·3	1·6561	59·55
338.	Worcestershire, Warwickshire, Gloucestershire, & Herefordshire	Ditto, ditto	17		5 6·47	146·6	1·6884	61·95

No.	REMARKS.
330.	By J. Towne Danson, Esq., F.S.S. Extracted from his valuable paper "On the Growth of the Human Body," in *Statistical Soc. Journal* for 1862. (See also Aitken "On the Growth of the Recruit.") ·8 inch and 10 lbs. allowed.
332 333	We have here an apparent exception to the ordinary rule of the inferiority in stature of convicts born in towns. It is due, I presume, to the smallness of the numbers.
335.	I have separated the Staffordshire convicts in order to exhibit their comparatively heavy weight, which seems to be a usual characteristic of the men of this county.
336.	J. D. Harries, Esq., Surgeon to the Shrewsbury Jail, through Dr. Henry Johnson. Of the 44, exactly half (22) bore names apparently Welsh. 10 lbs. allowed here and elsewhere, unless otherwise specified.
337.	10 of 23 had the combination of light eyes with dark hair, which is very prevalent at Birmingham.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
339.	Norfolk, Wilts, Kent, and intervening counties, except Bucks	Most from Wakefield and Southampton; some from Taunton and Bristol	54		5 5·56	142·0	1·6662	59·87
340.	Buckinghamshire	Prisoners in Aylesbury Jail	25		5 5·92	141·5	1·6744	59·64
341.	London	Mostly from Taunton Jail	29	5 5·57		133·1	1·6460	55·83
342.	Dorset, Devon, and Cornwall	From divers prisons	14		5 4·71	139·7	1·6445	58·83
343.	Somerset, West	Prisoners in Taunton Jail	40	5 7·17		146·8	1·6853	62·05
344.	Somerset, Mid	Ditto, ditto	24	5 7·76		147·1	1·7003	62·19
345.	Somerset, East	Ditto, ditto	20	5 6·10		142·5	1·6586	60·10
346.	Bristol	Prisoners in the Bridewell	23		5 3·60	135·7	1·6155	57·00
347.	Wales	From divers prisons	8		5 3·53	132·8	1·6136	55·70
348.	Ireland	Ditto, ditto	15		5 5·38	133·8	1·6606	56·15
349.	Scotch towns	Mostly from Wakefield	10		5 5·0	143·0	1·6510	60·32
350.	Englishmen; probably mostly Bristolians	In Bristol prison	90	5 6·35		140·0	1·6662	58·96
351.	Irishmen	Ditto, ditto	12	5 6·39		149·0	1·6672	63·05

No.	REMARKS.
339.	The Southampton convicts by Dr. Bond, of the Hartley Institute.
340.	John Humphry, Esq., Medical Superintendent Bucks County Asylum.
341.	·8 inch and 10 lbs. allowed.
343.	Mr. Oakley, Governor of the Taunton Jail, through Dr. Edward Liddon. ·82 inch and 10 lbs.
344.	Ditto, ditto. The tall stature is remarkable. Dr. Liddon agrees with me in attributing it, so far as it is not accidental, mainly to the fact that few of these prisoners are professional thieves, and that they are physically a sample of a mainly agricultural community.
345.	Ditto, ditto. ·8 inch and 10 lbs.
346.	R. W. Tibbits, Esq., Surgeon to the Bristol Infirmary.
350 351	·75 inch and 10 lbs. allowed. The comparison here is doubtless not quite fair, the English including more professionals, while the Irish were mostly confined for assaults, etc., and were probably an average sample, physically, of the Irish colony in Bristol.

RECRUITS, AGED 23 AND UPWARDS.—SCOTLAND, ENGLAND, AND WALES.

In this Table contiguous counties have been grouped together only where the averages yielded by them severally were nearly identical.

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height.		Average weight.	Naked height.	Naked weight.
				With shoes.	Without shoes.			
				ft. in.	ft. in.	lbs.	meters.	kilos.
352.	5 Highland Counties	Recruits examined, including those rejected	55		5 7·56	138·8		
	Glasgow and Paisley		78		5 6·84	135·8		
	Rest of Scotland		426		5 7·50	139·8		
	Scotland—total		559		5 7·41	138·9	1·7132	63·00
	4 Northern Counties		107		5 7·29	138·5		
	Yorkshire		187		5 6·88	135·9		
	Lancashire		360		5 6·88	137·0		
	Cheshire		53		5 7·29	139·9		
	Lincolnshire, Notts, Derbyshire		99		5 7·10	139·9		
	Staffordshire, Salop		91		5 6·87	138·8		
	Leicestershire, Rutland, Northants, Warwickshire, Worcestershire		136		5 6·77	137·4		
	Norfolk		27		5 7·59	143·0		
	Cambridgeshire, Hunts		23		5 7·11	139·7		
	Suffolk, Essex, Herts, Beds		97		5 6·88	137·5		
	Buckinghamshire		15		5 8·01	143·5		
	Gloucestershire		35		5 6·96	137·8		
	Herefordshire		17		5 6·63	143·2		
	Wales		96		5 7·05	140·9	1·7040	63·91

No.	Place or district of birth.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight.	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
	Middlesex (rural)		14		5 7·37	139·2		
	London		329		5 6·81	134·7	1·6980	61·09
	Surrey (rural)		14		5 6·43	139·8		
	Kent		50		5 6·97	140·4		
	Sussex		40		5 7·05	137·2		
	Hants, Berks, Oxfordshire, Wiltshire, and Dorset		128		5 7·23	140·2		
	Bristol		25		5 7·24	139·2		
	Somerset		68		5 7·49	140·0		
	Devon		42		5 7·04	140·1		
	Cornwall		15		5 7·70	139·2		
	England—total		2068		5 6·99	137·9	1·7023	62·54

IRELAND.

No.	Provinces, in the Order of the Proportion of Foreign Blood.	Class of persons observed.	No. of persons.	Average height. With shoes.	Average height. Without shoes.	Average weight. (Naked.)	Naked height.	Naked weight.
				ft. in.	ft. in.	lbs.	meters.	kilos.
353.	Down, Antrim, and Derry		178		5 7·48	135·92		
	Dublin, city and county		288		5 7·07	137·65		
	Rest of Ulster		220		5 7·29	137·60		
	Rest of Leinster		328		5 7·39	139·31		
	Munster		305		5 7·38	138·73		
	Connaught		198		5 6·90	137·10		
	Ireland—total		1517		5 7·25	138·03	1·7091	62·60

No.	County of birth.	No. of persons.	Average height.		Average weight. (Naked.)
			With shoes.	Without shoes.	
			ft. in.	ft. in.	lbs.
354.	Antrim	89		5 7·39	135·93
	Down	64		5 7·57	135·61
	Derry	28		5 7·57	136·78
	Tyrone	39		5 7·27	139·51
	Armagh	52		5 7·34	135·57
	Monaghan	34		5 7·35	138·41
	Fermanagh	32		5 7·22	139·06
	Cavan	30		5 6·94	138·36
	Donegal	28		5 7·51	135·93
	Tipperary	69		5 7·27	138·23
	Limerick	71		5 7·12	137·28
	Cork	105		5 7·27	138·40
	Waterford	29		5 8·13	142·81
	Clare	14		5 8·03	140·43
	Kerry	19		5 7·88	135·81
	Dublin	288		5 7·07	137·65
	Kildare	54		5 7·67	139·83
	Wicklow	31		5 7·62	141·32
	Wexford	35		5 7·36	135·17
	Kilkenny	29		5 7·71	143·00
	Carlow	24		5 6·93	137·71
	Louth	25		5 7·52	144·92
	Meath	47		5 7·23	138·36
	Westmeath	12		5 6·89	138·91
	Longford	20		5 7·18	140·20
	King's County	20		5 7·50	137·10
	Queen's County	28		5 7·08	135·37
	Sligo	31		5 7·26	136·45
	Mayo	62		5 6·64	137·53
	Leitrim	20		5 6·99	138·75
	Galway	49		5 7·21	138·38
	Roscommon	34		5 6·50	134·04

INDIGENOUS NAMES.

No.	Place or district of birth.	Class of persons observed.	NON-LABOURERS.			LABOURERS.		
			Number.	Average height.	Average weight.	Number.	Average height.	Average weight.
				ft. in.	lbs.		ft. in.	lbs.
355.	Down, Antrim, and Derry		27	5 7·70	131·37	32	5 7·54	141·97
	Rest of Ulster		39	5 7·53	137·59	77	5 7·00	138·15
	Ulster		66	5 7·60	135·00	109	5 7·16	139·27
	Dublin		20	5 6·76	133·68	80	5 7·24	141·11
	Leinster		61	5 6·84	136·82	122	5 7·52	140·49
	Munster		63	5 7·01	135·50	91	5 7·69	139·23
	Connaught		65	5 7·01	133·19	101	5 6·92	137·92
	Ireland—total		275			503		
	Averages			5 7·37	135·07		5 7·32	139·58

EXOTIC NAMES.

No.	Place or district of birth.	Class of persons observed.	NON-LABOURERS.			LABOURERS.		
			Number.	Average height.	Average weight.	Number.	Average height.	Average weight.
				ft. in.	lbs.		ft. in.	lbs.
	Down, Antrim, and Derry		67	5 7·34	134·00	32	5 7·25	134·06
	Rest of Ulster		39	5 7·79	138·05	47	5 7·20	136·91
	Ulster		106	5 7·50	135·49	79	5 7·22	135·75
	Dublin		74	5 7·21	136·11	49	5 6·94	139·31
	Leinster		50	5 7·32	140·30	72	5 7·47	138·40
	Munster		33	5 7·70	135·85	42	5 7·56	140·81
	Connaught		14	5 6·68	135·07	39	5 6·48	139·50
	Ireland—total		277			281		
	Averages			5 7·37	136·55		5 7·19	138·29

COMMENTARY.

I HAVE endeavoured to put before the Society the materials I have gathered in as complete and lucid a manner as possible. In so doing, I may have laid myself open to the charge of needless particularity, by making too minute subdivisions; but as my object has been to allow the data to speak for themselves, and not merely to bring forward an array of one-sided facts to support my own theories or conclusions, I do not see that I could well have done differently.

The returns may be roughly divided into four classes, viz., private, lunatic, criminal, and military returns. The last class might perhaps have been expected to yield the most accurate and valuable data, at all events for the comparison between the several counties and districts; but I am satisfied that as regards England, Wales, and Scotland, such is not the case, whatever it may be in Ireland. The military returns from Great Britain are to a great extent unconformable with the other three classes, which, on the other hand, generally agree among themselves. In my opinion this unconformability may in most cases be explained by the condition of the local labour-market. Thus in Somerset the peasantry are abundant in numbers, and the rate of wages is rather low; and I am informed by Mr. Malet (see No. 234) that the military service is very popular, and that a great part of those young men who are sufficiently tall enter the marines or other corps. Here, accordingly, we find that the recruits average much higher than in some other counties; while the private returns point in a contrary direction.

On the other hand, where wages are high, and where there is much demand for men of superior physique, military service

is less esteemed, and the recruiting sergeant cannot so easily obtain tall men. In such districts he has to fall back on the artizans and unskilled labourers of the towns, who are very frequently undersized. The low position of Yorkshire in the scale is probably due mainly to this cause, and the very high one of the small county of Bucks to accident. Norfolk, Cornwall, and Durham doubtless fairly deserve their high places, and London and Glasgow their low ones, but little use can be made of these facts in the face of the contrary instances already cited.

When, however, we abandon the geographical method of arrangement, and classify these same materials with a view to the occupations of the men, and the industrial character of their birth-districts, we obtain from them some coherent and valuable information.

It may be necessary to remind the reader, before I call his attention to the tables I have framed on this principle, that the differences of average stature and weight, shewn therein to exist between the members of different occupations, are in truth vastly less than they would have been, had there been no minimum standard. It is obvious that the lower the average stature in any trade, the greater will be the proportion of its members who will be shut out from the comparison, and the greater will be the difference between the true average height, and that yielded by those men who are tall enough to enter the army. For example, the average height of the Connaught recruits is 5 ft. 6.9; of those from Dublin 5 ft. 7.07; and of those from Ulster, Munster, and the remainder of Leinster 5 ft. 7.38; yet observation of the curves formed by comparison of the numbers at each measurement, renders it probable that the average stature of the class supplying the recruits is, in Connaught, as low as 5 ft. $5\frac{1}{2}$, in Dublin somewhere about 5 ft. $6\frac{1}{3}$, and in the rest of Ireland not less than 5ft. $6\frac{3}{4}$, the real being $2\frac{1}{4}$ times as great as the *apparent* difference between Connaught and Ulster.

I have divided England and Wales into five groups of districts, basing the arrangement on the industrial character of the populations of the several counties. Thus the Sussex group consists of Sussex, Berks, Herts, Bedfordshire, Bucks, Oxon, Cambridgeshire, Essex, Suffolk, Norfolk, Wilts, Dorset, Here-

fordshire, Salop, Lincolnshire, and North Wales, in all of which the agricultural element preponderates. The Kent group, which holds an intermediate position in this respect, contains Kent, Hants, Northants, Somerset, Gloucestershire, Devon, Cornwall, Notts, Cumberland, Westmoreland, Leicestershire, South Wales, with Monmouthshire, and the rural parts of Middlesex and Surrey. In the third or Staffordshire group I have included Cheshire, Staffordshire, Worcestershire, Warwickshire, Derbyshire, Durham, and Northumberland, with the city and county of Bristol: in these, manufacturing and mining industry begins to occupy the bulk of the population. A fourth group includes the manufacturing counties of Lancashire and Yorkshire; and a fifth the metropolis. A sixth is constituted by Scotland, which could not be satisfactorily divided. My classification of employments will explain itself. I have omitted some from the district tables which appear in the summary, because they furnished numbers too small to be of any use.

I.—GENERAL SUMMARY FOR GREAT BRITAIN.

Occupations.	Number.	Avge. Stature.	Avge. Weight.
Miscellaneous Outdoor -	174	5 ft. 7·56 in.	142·11 lbs.
Clerks, &c. - -	242	5 ,, 7·28 ,,	136·74 ,,
Masons, &c. - -	100	5 ,, 7·13 ,,	139·12 ,,
Labourers - - -	834	5 ,, 7·11 ,,	140·36 ,,
Ironworkers - -	209	5 ,, 7·11 ,,	140·22 ,,
Woodworkers - -	200	5 ,, 7·08 ,,	137·07 ,,
Bakers - - -	34	5 ,, 6·91 ,,	142·06 ,,
Miners - - -	67	5 ,, 6·91 ,,	138·21 ,,
Tailors and Shoemakers	135	5 ,, 6·89 ,,	134·49 ,,
Miscellaneous Indoor -	335	5 ,, 6·77 ,,	132·53 ,,
Grooms - - -	101	5 ,, 6·57 ,,	138·72 ,,

II.—SUSSEX, &c.

Miscellaneous Outdoor -	28	5 ,, 7·55 ,,	145·35 ,,
Labourers - - -	182	5 ,, 7·30 ,,	141·80 ,,
Shoemakers and Tailors	14	5 ,, 7·20 ,,	136·85 ,,
Ironworkers - -	25	5 ,, 7·06 ,,	140·80 ,,
Woodworkers - -	30	5 ,, 6·88 ,,	137·70 ,,
Clerks - - -	30	5 ,, 6·88 ,,	134·23 ,,
Miscellaneous Indoor -	17	5 ,, 6·82 ,,	135·41 ,,
Masons, &c. - -	16	5 ,, 6·65 ,,	135·40 ,,
Grooms - - -	32	5 ,, 6·28 ,,	139·20 ,,

III.—KENT, &c

Occupations.	Number.	Avge. Stature.	Avge. Weight.
Clerks, &c. - - -	43	5 „ 7·57 „	139·51 „
Miners - - -	12	5 „ 7·52 „	143·92 „
Labourers - - -	166	5 „ 7·05 „	140·77 „
Woodworkers - -	42	5 „ 6·96 „	136·33 „
Miscellaneous Indoor -	37	5 „ 6·94 „	134·19 „
Grooms - -	20	5 „ 6·83 „	139·90 „
Miscellaneous Outdoor -	38	5 „ 6·81 „	142·00 „
Shoemakers and Tailors	31	5 „ 6·81 „	136·64 „
Ironworkers - -	30	5 „ 6·79 „	138·71 „
Masons, &c. - -	15	5 „ 6·65 „	138·66 „

IV.—STAFFORDSHIRE, &c.

Miscellaneous Outdoor -	14	5 „ 7·72 „	143·00 „
Miners - -	18	6 „ 7·30 „	141·08 „
Woodworkers - -	20	5 „ 7·28 „	138·80 „
Ironworkers - -	25	5 „ 7·10 „	140·25 „
Clerks - - -	30	5 „ 7·10 „	136·36 „
Labourers - - -	87	5 „ 7·08 „	140·26 „
Grooms - - -	15	5 „ 7·03 „	143·33 „
Shoemakers and Tailors	17	5 „ 6·91 „	133·00 „
Miscellaneous Indoor -	45	5 „ 6·84 „	135·44 „

V.—LANCASHIRE AND YORKSHIRE.

Ironworkers - -	49	5 „ 7·37 „	139·66 „
Miscellaneous Outdoor -	40	5 „ 7·26 „	140·05 „
Masons, &c. - -	19	5 „ 7·22 „	139·05 „
Clerks, &c. - - -	45	5 „ 6·92 „	137·95 „
Labourers - - -	170	5 „ 6·88 „	138·72 „
Miscellaneous Indoor -	48	5 „ 6·76 „	132·85 „
Woodworkers - -	38	5 „ 6·75 „	137·76 „
Shoemakers and Tailors	21	5 „ 6·66 „	132·14 „
Spinners, Weavers, &c.	37	5 „ 6·63 „	132·13 „
Grooms - - -	12	5 „ 6·33 „	134·66 „
Miners - - -	10	5 „ 6·10 „	137·90 „

VI.—LONDON.

Miscellaneous Outdoor -	16	5 „ 7·36 „	139·12 „
Clerks, &c. - - -	66	5 „ 7·10 „	132·30 „
Labourers - - -	94	5 „ 6·91 „	137·52 „
Masons &c. - -	10	5 „ 6·90 „	137·70 „
Woodworkers - -	30	5 „ 6·89 „	132·70 „
Shoemakers and Tailors	20	5 „ 6·65 „	134·30 „
Ironworkers - -	15	5 „ 6·46 „	137·80 „
Miscellaneous Indoor -	57	5 „ 6·43 „	130·18 „
Printers - - -	10	5 „ 5·82 „	128·20 „

VII.—SCOTLAND.

Occupations.	Number.	Avge. Stature.	Avge. Weight.
Drapers, &c. - -	10	5 „ 8·80 „	138·50 „
Miscellaneous Outdoor -	38	5 „ 7·93 „	143·44 „
Woodworkers - -	40	5 „ 7·74 „	139·67 „
Clerks - - -	40	5 „ 7·72 „	140·10 „
Labourers - - -	135	5 „ 7·43 „	142·00 „
Masons, &c. - -	31	5 „ 7·32 „	139·61 „
Ironworkers - -	63	5 „ 7·23 „	141·70 „
Weavers, &c. - -	27	5 „ 7·23 „	131·44 „
Printers - - -	18	5 „ 7·21 „	131·44 „
Shoemakers and Tailors	32	5 „ 7·11 „	133·84 „
Bakers - - -	15	5 „ 6·92 „	146·06 „
Miscellaneous indoor -	49	5 „ 6·87 „	131·87 „
Miners - - -	24	5 „ 6·70 „	133·54 „
Grooms - - -	15	5 „ 6·56 „	133·00 „

In commenting on these tables, I shall consider separately each of the occupational classes into which I have divided the recruits. First in importance, as in number, come the "*labourers.*" It is unfortunate for my purpose that under this term are comprised in the recruiting books two or three sets of men who differ in several important respects, viz., the agricultural labourers or peasants, who are almost invariably born in rural districts or in villages; the railway labourers and excavators, not so exclusively of rural birth; and the general labourers, the unskilled workmen of towns, who are a very miscellaneous class, partly, indeed, consisting of the overflow and scum of the peasantry, but in great part townsmen by birth as well as habitation and manner of life, and, as a rule, inferior physically and morally to the country folk. This last section of the "labourers" contributes far more largely to the army, in proportion to its numbers, than does the first. It is probable, however that in the Sussex, if not in the Kent table, the majority of the recruits are really of the peasant class, the class to which, if my view be correct, we ought to look for the supply and revivification of our somewhat effete urban population. It is thus that I should explain the fact that the stature is higher in the labourers of the Sussex table than anywhere else except in the Scotch one, and that it declines pretty regularly with the increase of the urban element. In the Staffordshire

table, indeed, it is a little higher than it ought to be on this view; but this superiority may very well, if not accidental, be a matter of race, my Staffordshire group including several of the more Scandinavian counties.

Clerks include shopmen, commercial travellers, &c. Many of them are born in the middle class, and in childhood are well fed and exempt from labour: on the other hand, the nature of their occupation after puberty is on the whole unfavourable, being more or less sedentary, and carried on in towns and often in impure air. The results are what might have been anticipated: the clerks are generally above the medium stature and below the medium weight.

Ironworkers and *Woodworkers* are two classes with several points of resemblance, but which come out with distinctive characters in these tables. In almost all branches of both, the work is active, and in most, especially of the former, laborious: in most cases it is carried on where there is free access of air, and the wages are sufficiently good to furnish a plentiful dietary. Probably more of the Ironworkers may be looked upon as picked men, some processes in the manufacture of iron requiring so much exertion and endurance of heat, that none but strong youths would willingly offer themselves for the work. The stature and weight are pretty much what one might have predicted; in both divisions the former ranges rather high, but there is a pretty constant though moderate difference in weight between the two, the ironworkers rather surpassing the average, the woodworkers not quite reaching it. A sub-class might be formed of the cabinet-makers, carvers, turners, &c., who work always indoors and with a less free motion, and of whom, as in almost all the smaller or more specialised handicrafts, the greater part are town-born. 42 of them yield averages of 5 ft. 6·88 in. and 133·6 lbs., which closely approach those given under the head of *Miscellaneous Indoor Occupations*, to which they might perhaps with propriety have been referred. The 158 carpenters, joiners, sawyers, wheelwrights, &c. who remain, will yield averages of 5 ft. 7·13 in. 138·0 lbs., so that their inferiority in weight to the ironworkers will still be pretty well marked. Sawyers are almost always light; their work

is extremely severe, and many of them suffer from pulmonary or cardiac disease.

The class of *Masons* (including stonecutters and bricklayers) is hardly numerous enough to yield satisfactory results. They appear to stand pretty well as to development in both height and weight. The chronic pulmonary disease, which is so destructive to stone-masons, does not often tell upon them until after the period of life with which we are concerned; and, with the exception of the stone-dust, the influences to which this class is exposed are almost wholly favourable.

Miners also are rather few in number, and their position is somewhat doubtful. The lead and tin miners seem usually to stand above the colliers; but if it be really so, it may be partly due to differences of race as well as to differences of occupation. The low stature of the Scotch miners, who are chiefly colliers, may perhaps thus be partly accounted for; for the evidence of surnames testifies to a notable infusion among them of English and Welsh blood.

I have set down the *Bakers* separately, though so few in number, because the short stature and high weight, which characterise them in the Summary, follow them through almost all my divisions, so that they may perhaps not be merely accidental. If not, they can only be accounted for by the combination of a mainly indoor employment with excess of farinaceous food.

Grooms are a peculiar class by nature and by selection. Short lads and men are generally preferred for the work; and moreover, unless I am deceived, the instinctive attraction towards the horse, found in grooms and in so many of what are called "sporting men," belongs to a temperament usually found among men of short compact build. The occupation is a healthy one, and the relative weight rules high.

Tailors and *Shoemakers* I have classed together. There is a striking resemblance between them as to the nature of their work, and the manner of carrying it on. No trades are more purely and strictly indoor and sedentary than these, and in each the labour is, generally speaking, restricted to certain monotonous and cramped movements of the upper extremities, while

the habitual position is such as to favour the production of visceral disease. There are, however, minor differences between the two. Of these the most important lies, I believe, in the fact that the tailors more frequently work in hot, crowded, and foul-aired rooms; and to this their greater mortality in early life is probably attributable. Nevertheless the shoemakers, as seen in the out-patient rooms of hospitals, are, as a rule, the worse developed of the two, and they suffer more from dyspeptic affections than any other class of workmen. In the recruiting returns the tailors have slightly the advantage in height; but even in that respect they, as well as the shoemakers, fall considerbly below the average; while in weight their inferiority is still more marked.

There remain to be considered the numerous miscellaneous trades and vocations, which, as they could not be joined with congruity to any of the previous combinations, I have simply divided into *outdoor* and *indoor*. The one division shades off into the other in such a manner that I have, in several instances, had difficulty in placing the members of a particular trade on either side of the line. In such cases I have generally decided the matter in accordance with the amount of exertion involved, classifying the more laborious with the outdoor employments. In the outdoor class I have ranged the butchers, tanners, carters, sailors, gardeners, farmservants, gamekeepers, plasterers, ropemakers, porters, millers, brickmakers, firemen, and the like; in the other, all those who work in metals on a small scale, or in textile manufactures, with the printers, painters, plumbers, potters, saddlers, &c. The physical difference between the two classes thus formed is very great, for in such a case the excess of $\frac{8}{10}$ of an inch represents, as I have already endeavoured to explain, an actual average excess in the mass of outdoor workmen which furnishes the recruits, over the corresponding mass of indoor workmen, which may perhaps amount to two inches or more. Nearly the same thing may be said as to the differences in weight, though on this subject my data furnish more hazy indications.

So much for the military returns from Great Britain. Those from Ireland wear a different aspect; they have more of ethnological interest, and in them the relations of variations of mean stature

to locality are somewhat clearer and of more value; while the small number of recruits described otherwise than as "labourers" would render any comparison of occupations, such as I have made with respect to Great Britain, almost wholly useless. I shall therefore defer the consideration of these Irish returns until towards the close of my inquiry.

The lunatic and the criminal returns have each their own special aspect and character; but both of these series have a general conformability with that of private returns.

The predisposing and exciting causes of lunacy and of criminality respectively, are so many, various and complex, that any physical character common to the whole of each series could not of course be expected to appear. And when I find that both lunatics and criminals are on the average shorter and smaller than sane and honest men, I deduce nothing more from the fact than this: that there are certain genera in each of these classes in which physical coincides with mental or moral degradation. Such I *believe* to be—firstly, hereditary lunatics, and those sprung from inbred families; and, secondly, hereditary and professional criminals.

It should be noted that my schedules were filled up with such lunatics only as were in fair bodily health; and that idiots and congenital imbeciles were expressly excluded. I struck out from them also all persons returned as "of no occupation", supposing such to have been usually either imbecile or insane from boyhood; *i.e.*, previous to the completion of growth. Those disqualified by this rule were mostly little men.

It is not possible to strike anything like a perfect average of either the Scotch or the English lunatics, because in some cases in Scotland, and most in England, I have only a sample of the asylum population; and because, unfortunately, there are considerable gaps in the tables, Morningside, Aberdeen, and Dundee asylums having sent me no returns; and the West Riding, Northumberland, Cornwall, and Lincolnshire, with four other English county asylums of less importance for my purpose, being similarly deficient.

The average for Scotland may, however, be roughly stated as somewhere about 5 feet 6·5 inches and 138 lbs. (naked);

the Borderers and Highlanders exceeding the standard of height considerably, and the Hebrideans falling much below it.

In some of the northern and north-eastern counties of England the stature is about the same as in Scotland. But in Wales and the southern counties, with very few exceptions, it ranges between 5 feet 5 inches and 5 feet 6 inches, and in London, Birmingham, Nottingham (town), Devon and Glamorgan falls below 5 feet 5 inches. The average weight varies more in England than in Scotland, and in some counties (*e.g.*, Kent, Norfolk, Gloucestershire) rises much higher. Something may be allowed here for national or racial varieties of temperament. The typical Saxon Englishman is constitutionally a heavy feeder, and prone to corpulence, as compared with the other inhabitants of our islands. Differences in dietary must also be taken into account, and especially the larger use of beer in English asylums.

It would appear that dark eyes and black or very dark hair are more common among lunatics than in the general population. Tall, dark-haired persons seem to be particularly subject to melancholia, and this fact accords with the ancient doctrine of temperaments.

The criminals from the General Prison of Scotland, of whatever nationality, surpass in size those from the English prisons; and the Scottish prisoners surpass the Scottish lunatics: on the other hand, in England the convicts, as a rule, hardly come up to the lunatics in stature and weight. This may, I believe, be accounted for by the greater proportion of hereditary and habitual criminals in the English prisons. Somerset, a mainly agricultural county, in which professionals are comparatively few, furnishes a striking exception to this rule as to stature: the prisoners at Taunton surpassing the Somerset lunatics in that respect, and about equalling the free population. (See 225-240, 315, and 343-344.) The inferiority of the townsmen to the country-born criminals is in general sufficiently marked. The returns indicate no peculiarity or predominance of colour among them, such as has been noted to occur among lunatics.

I will now proceed to consider the most valuable part of my material—the private returns from Great Britain—surveying

them firstly in geographical order, and confirming or correcting their indications by those of the other three classes of returns; and thereafter endeavouring, partially at least, to unravel the respective influences of race and of the various media, such as soil, climate, and mode of life.

Roughly speaking, the natives of Scotland and of the north and north-east of England exceed in stature those of Wales and of the south and west of England; the most notable exceptions to this rule being, in the northern division, the people of certain large towns and of some of the Hebrides, and in the southern, those of Cornwall and the Scilly Islands.

The Shetlanders seem to be of fair stature (about 5 feet 7·8 inches, or 1·723 metre), but their bulk hardly corresponds to their height. In the Western Islands there are considerable local variations. The Uist men, for example, are tall and large; the men of Lewis, and of St. Kilda, are, compared with Scotchmen in general, decidedly short, though they would not appear so in the south of England. The Lochbuy people, in Mull (No. 11) are remarkable for their huge size; but this may not be common to the whole island. Taking the Hebrideans all together, they seem to be shorter, but hardly less bulky than the mainland Highlanders, and here the lunatic returns (263, 264) are confirmatory.

With respect to the Highlanders of the mainland, contrary opinions have been and are still often expressed. Some speak of them as gigantic; others as stunted; others, again, more discriminating, say that the descendants of the ruling families or septs are generally large and fair, those of the commonalty, or of dependent septs, small and dark; or, lastly, that particular clans have often a common character, the Campbells, *e.g.*, being red-haired; the Camerons small, wiry, and dark-haired.

I believe it would accord with what has been observed in other mountainous and sequestered regions, such as Switzerland and Styria, if there were considerable variations in average stature between one neighbouring valley or district and another. And, from general observation, I think such is the case; and I regret that I have been unable to procure returns from some other portions of the Highlands, which might have brought out the fact.

Be this as it may, and whatever may have been the physical condition of the dependent Highlanders in former times, the evidence of all the four classes of reports—private, military, criminal, and lunatic—proves the modern Highlanders to be, as a rule, a tall and bulky race. Several of the private schedules were collected in such a manner as to avoid all suspicion of unfairness (*e.g.*, 17, 20, 22, 23, 25); and the averages yielded by them (about 5 feet 8·12 inches and 153½ lbs., naked, = 1·731 metre and 69·6 kilos) do not differ much from those of the other returns. It is probable, but not proven, that the Athol and Breadalbane Highlanders (see No. 26) generally exceed their compatriots in bulk, if not in stature.

Among the Scottish Lowlanders, the people of the anciently Norse district of Caithness have been ranked by several observers as physically the finest peasantry in Britain. I should have been disposed to agree to this statement; but my figures (15 and 16) shew no difference between them and their neighbours. In Buchan and in the East of Scotland generally (30 to 45) we have still a tall and generally bulky race, with apparent exceptions, however, among the fisher folk and the town artisans.

The Edinburgh and Glasgow returns (46 to 48) are quite exceptional among the private ones, and tend to shew a considerable diminution of size in the townsmen. The military and criminal returns (349, 352) confirm this; the asylum ones (272, 273) do not; but some extensive observations on the *inhabitants* of Edinburgh, published in Johnston's *Physical Atlas*, yield further confirmation, giving a height, for the lower and middle classes, of 5 feet 7⅓ inches, including shoes.

Proceeding southwards, we have from the Strathclyde and Galloway regions a very valuable and remarkable series of careful observations (49 to 54), which sufficiently attest the lofty, almost gigantic stature, of the local population. This rises in Upper Galloway (whence, from personal observation, I had expected to receive the highest average in Great Britain) to about 5 feet 10½ inches (1·790 metre) *without shoes*.* The remainder of

* In some copies these figures have, through inadvertence, been placed in the wrong column.

Southern Scotland presents some variations: if the tallest men in Britain are found in Galloway, Berwickshire must have the honour of producing the heaviest (57). The Borderers in general equal or surpass the average of Scotland in both respects.

The Borderers of the English side have a still more unequivocal superiority over their own countrymen. Northumberland, thanks to Mr. Tate, is largely represented in the returns; but, unfortunately, only 64, 71, and perhaps 66, can be taken as average samples. These three yield a mean of 5 feet 8·4 inches, and 154 lbs., naked (1·737 metre and 69·8 kilos.), which is probably little, if at all, over the mark. The county volunteers (63, 65-69) are about half-an-inch taller; the country-born militiamen (70), who are taken from a less favoured class, and are certainly below the general average, are a full inch shorter. Mr. Tate thinks the mean of these two would be near to our desideratum. Some items in No. 70 may be useful, in conjunction with 323-4-5 and the lunatic returns, to enable us to form an idea of the extent of *national* differences in stature.

The average of Cumberland and Westmoreland, exclusive of Carlisle, comes out 5 feet 8·1 inches and 152 lbs., naked,* (1·730 metre and 68·9 kilos.), that of Westmoreland being, as it probably should be, the higher of the two. That of Durham is evidently rather lower; but the county is insufficiently represented. This cannot be said of the great county of York, whence we have a large number of returns, from all parts and from all classes; if one might presume to strike an average for a county within whose limits there is very great variation in all the media, though little in the race, it would come out about 5 feet 7·2 inches and 146 lbs., or 1.707 metre and 66·2 kilos. But this is an average of very discrepant elements. The unmixed and undwindled Yorkshire breed, in the hills and valleys of the east, north, and north-west of the county, rise to about the same level with the peasantry of Scotland and of the English border. No. 84 yields the tallest, and No. 88 the heaviest of the English averages. Of the contrast afforded by

* Henceforward, all measurements and weights spoken of are to be considered as taken without shoes or clothing.

the manufacturing towns I will speak hereafter: it affords a partial explanation of the low position of Yorkshire in the military returns.

Lancashire is a very exceptional county. The true native breeds used undeniably to be tall in the northern and rather large in the southern districts; but all the four classes of reports, private, lunatic, criminal, and military, concur in averaging as low as, or lower than, those of England generally.

On the other hand, the Danish counties of the North Midland region, Lincolnshire, Nottinghamshire, Derbyshire, and Leicestershire, excluding only the large manufacturing towns, range rather high in stature. The averages for Lincolnshire are 5 feet 7·5 inches and 149 lbs.; for Notts nearly 5 feet 7 inches and 142 lbs. That for Northamptonshire is hardly less; but we are now coming to the frontier of undersized men. Part, at least, of Staffordshire belongs to the north of England in this point of view (see 121 and 123); but the comparatively high weight is the ruling characteristic of Staffordshire.

Returning to the eastern counties, we find a number of reports from Norfolk. Taken in connection with the military and lunatic statistics, they seem to indicate a generally high average of both stature and weight, culminating in the north-eastern and ethnographically remarkable district of Flegg (141); but sinking low in the central and perhaps other parts of the county. Suffolk stands low as to height, but comparatively high in weight. The Isle of Ely seems to produce rather tall men; but in the southern part of Cambridgeshire, and the south-midland counties generally, we find a decidedly undersized population. Among the reports from this region, the Harpenden one (159, 161) is very valuable as being both extensive and unexceptionably fair; it yields averages of little more than 5 feet 5·4 inches and 137 lbs. (1·663 metre and 63·2 kilos.)

I hope that the publication of this paper may lead to further observations on the physical condition of the working classes of the metropolis. My own efforts in that direction have had but slender results; but No. 162 is a valuable specimen of a

community who seem to have dwindled down, under the influence of unfavourable media, to an extent, it may be hoped, unparalleled in Europe. The military, lunatic, and criminal returns all agree in placing the native Londoner very low in the scale of stature.

Turning again to the west, we find the averages at Birmingham not so much lower than those of the surrounding country as those at Sheffield. Worcestershire appears to stand well. Salop, whence the materials are pretty plentiful, yields averages (No. 180) much resembling those of the neighbouring North Wales. The character of the Welsh generally is moderate or rather short stature, with a bulk more than proportionate. Judging from my materials, I should estimate the mean height at little, if at all, more than 5 feet 6 inches, and the weight at 145 lbs. (say 1·680 metre and 65·7 kilos.) But there are portions of Wales (see 186, 187) where the native breed is tall as well as bulky.

Data are deficient, as already remarked, for the interesting county of Kent, except only Romney Marsh, whence 192 yields averages of 5 feet 7·1 inches and 145 lbs. But the general position of the south and south-east of England is rather low in the scale. The asylum reports for Sussex, Hants, and Wilts, being exhaustive, give valuable indications, and if we allow* an inch for the excess of stature in the sane over the insane, we get an average of 5 feet 6·4 inches, or rather less. One of 5 feet 6·3 inches, with a weight of 140·6 lbs., comes out from a summary of all my Gloucestershire reports (210-219); but the purely rural population would somewhat exceed this standard. The Somerset averages (224-240) are lower than those for Gloucestershire, and the asylum reports bear out the fact; yet Somerset, for reasons already touched upon, stands high in the scales of the military and criminal series. In the city of Bristol (220) the average of 5 feet 5·8 inches and 132½ lbs. (1·67 metre and 60 kilos.) is probably very nearly correct, though it might have been elevated a trifle if I could have included in the tables a fairer proportion of the middle

* This allowance I deduce from a comparison of the two in several other counties.

class. The Devonshire men are (except towards the border of Cornwall) of short stature, apparently averaging about 5 feet 6 inches; but, like the Welsh, they are comparatively of good weight. Finally, the Cornish evidently merit the reputation, which they have enjoyed for centuries, of being a tall and stalwart race. I regret that I have no opportunity of testing the private reports by one from the county asylum; but from the former I should deduce a probable average stature of 5 feet 7¼ inches, and a weight of 150 lbs. (1·709 metre and 68 kilos.); and even this standard is clearly exceeded with respect to height by the people of Scilly, whose proportions certainly give the lie to the current notion that men and quadrupeds must degenerate in small islands.*

What may be the average stature of adult Englishmen is a matter of speculation and curiosity, on which one cannot give any but a cautious and guarded opinion. Without doubt it lies somewhere between 5 feet 6 inches and 5 feet 7 inches (1·676 and 1·702 metres). The mean of my private returns (excluding those which consist mainly or wholly of picked men) would occur somewhere about 5 feet 6⅞ inches (1·693 metre); but the number of those reports whose average greatly exceeds this mean is greater than that of those whose average falls greatly below it. The mean of the English lunatic reports would be somewhere about 5 feet 5¾ inches; and comparison of these with the private reports leads me to think the average of able-bodied lunatics to be nearly an inch below that of the sane. The criminal statistics point to nearly the same conclusion.† Recruits over 23 years, including rejected men, average, as has been shewn, about 5 feet 7 inches; but the culminating point of the curve yielded by the numbers of men at each grade of stature falls short of 5 feet 6½ inches. On the other hand, the classes from which most of these recruits are obtained, are certainly inferior to the rest of the population in

* The natives of the Isle of Ushant are taller than other Bretons; and the O'Driscols, who inhabit the Island of Cape Clear, are also said to be remarkable for high stature.

† Quetelet found the convicts in Vilvorde prison to average nearly ·8 inch (2 centimetres) below the free inhabitants of Brussels.

stature as well as in some other respects. On the whole, my estimate would be 5 feet 6·6 inches or 1·690 metre.

The average for Scotland must certainly be very much higher, perhaps as high as 5 feet 7½ inches; but this can be little better than a mere guess. That for Ireland cannot differ much from that for England; as may be gathered from the following indications:—1st. The English private returns run higher than the Irish ones (258, 359); but many of the former are taken from more favoured classes of the population. 2nd. The Irish military returns (353) overtop the English ones (352) by a quarter of an inch; but here the comparison of classes is probably favourable to Ireland. 3rd. The Irish lunatics about equal the English lunatics in stature, but fall below them in weight. 4th. The Irish criminals (326, 348, 351) equal or surpass the English criminals; but a larger proportion of the former are non-professionals in crime; and it is the professional criminal who contributes most to pull down the average stature of prisoners. 5th. In the Newcastle militia (70) the Irishmen hold a fair medium position.

The recruiting and other returns seem to indicate a slightly greater uniformity of stature among the Irish, very tall and (probably also) very short men being comparatively rare among them.

There is a remarkable uniformity in the several classes of returns as to the average weight of Irish peasants and labourers —an uniformity depending partly no doubt on the utter absence of corpulent persons among them. The naked weight may be estimated at about 138 lbs. (62·6 kilos.) The average of both Englishmen and Scotchmen, and indeed of Welshmen also, seems to exceed this. My private returns would lead me to put that of Englishmen somewhere about 145 lbs., and that of Scotchmen 10 lbs. higher; but in the latter case, and perhaps in the former also, sufficient allowance is not made for the under-sized and ill-fed population that crowds our large towns, and of which Nos. 47 and 48 are the only specimens in the returns from Scotland.

Data suitable for comparison with mine, taken from other countries and races, are, so far as I can ascertain, extremely

scanty. The conscription returns for France, which have yielded such valuable results in the hands of Broca, Boudin, Guibert, and Butillon, consist of young men in their twentieth year, and who consequently have not attained their full stature; and nearly the same may be said of other conscription returns. Dr. Short's careful observations on natives of the Dravidian portion of India, are, for the most part, applicable; and it is noteworthy that some castes in that region appear to surpass in stature the average Englishman, though they all fall below him in weight. Dr. Thomson's observations on the Maoris* are also fairly comparable, and some of those of the Novara expedition. But the only ones near home with which I am acquainted are some of those of Quetelet on the Belgians. He found the adult inhabitants of Brussels to average 1·684 metre (5 feet 6·3 inches) and 63·4 kilogrammes (139·8 lbs.) My 380 Gloucestershire men gave me exactly the same height, with a weight of 63·7 kilos. (140·5 lbs.); but of the Brussels men a considerable number belonged to the middle class, while of the 380 not more than a twentieth part were above the labouring class. The average weight of 40 Frenchmen, inhabitants of Massy, near Paris, was found by Tenon, in 1783, to be 62 kilogrammes (136·8 lbs.) These figures indicate less difference in favour of southern Englishmen, compared with their nearest Continental neighbours, than is generally supposed to exist. The common but erroneous opinion is no doubt derived partly from comparison of British with French, Belgian, or Rhineland soldiers. In most continental countries, a far smaller percentage of the population is excluded by the regulations as to stature, than with us in England. In France the proportion is 77 per thousand; while I have found in Northamptonshire, taking 5 feet 5 inches as the regulation height, 210 per cent. of adults beneath it; in Wilts and Somerset, 260 to 280; in Bristol, 353; and in Hertfordshire, 417. In point of fact the regulation height has more often been fixed at 5 feet 6 inches than at 5 feet 5 inches; and it is applied to growing youths of

* He found the Maoris to average 5 feet 6·25 inches, and 140 lbs. (1·683 metre and 63·5 kilos.), thus exactly equalling the Brussels and the Gloucestershire men.

19 or 20 equally with the grown men of 23 and upwards, who alone figure in my tables; and we may therefore confidently assume that in many parts of southern England, and particularly in some large towns, a large majority of young men are excluded from the army by the regulations. Many of these men have every qualification, except stature, for making excellent soldiers; and the impolicy of so narrowly circumscribing our choice of recruits is self-evident.

We may now proceed to dissect the evidence already laid down in its bearings on the great question whether race or media have the greater influence in determining the average size of the British people. In valuing the potency of race—that is, of indefinitely remote hereditary character—we are encompassed with difficulties, and are in danger of being reduced to arguing in a circle; for the characteristics we are accustomed to attribute to the several races which we believe to enter into the composition of our nation, are derived as much from observations of types now existing, or imagined to exist, as from authentic descriptions of those prevailing among our most remote ancestors, or positively identification of their traits by means of ossuary remains.

We know, indeed, that at the period of the Roman conquest the Caledonians were remarkable for their huge frames, and that certain other Britons were conspicuously tall; while we have reason to think (whether we adopt or reject Dr. Thurnam's views) that in certain parts, at least, of Britain, men of medium or short stature were, or had been, numerous. We have reason also to suppose that the Roman Conquest introduced an element of population into the east and south of Britain, among which a rather short stature prevailed. The "Saxon" invaders are thought to have been tall men ("Saxones vero staturâ et vigore maximi," says Henry of Huntingdon); and some of them were so; but we have not much evidence on the subject. The modern Frisians are certainly tall; but the Low Dutch race who dwell to the south of them, and whose kindred seem to have co-operated with them in the conquest and settlement of eastern England, are of a shorter and thicker

build.* The next element introduced—the Scandinavian—on the whole, much resembled the Frisian; the mean stature of the Norsemen was high. The modern Norwegians are generally large men; and of 20 Icelanders, whom Dr. Jon Hjaltelin, of Reykjavik, kindly measured and weighed for me as a sample of their countrymen, the average, corrected for shoes (or rather rivlins) and clothing, was about 5 feet 8·5, and 156 lbs. (1·740 meter and 70·7 kilos.) Immigration from France, during and after the Norman Conquest, and from the same country after the revocation of the Edict of Nantes, may have tended slightly to lower the stature in London, Norwich, and some other places or districts in the south and east of England, but hardly anywhere else. And still more recently, several other cities have had their population more or less modified by the infusion of a more purely Keltic element—Irish in Glasgow, Welsh in Bristol, both Irish and Welsh in Liverpool.

If we look at our facts in a broad and comprehensive way, we may be disposed to think that they present a certain degree of conformity to what a student of race history might have expected. Thus we find that, wherever the Scandinavian element is proved to be strong by historical, topographical, or linguistic evidence, the stature is decidedly high. This is the case in Shetland, Caithness, the eastern lowlands of Scotland generally, in Dumfries-shire, Cumberland, Westmoreland, Lonsdale, Durham, Yorkshire (except Sheffield and Haworth), Lincolnshire, Nottinghamshire, and Leicestershire, and in the hundreds of Flegg in East Norfolk. The island of Lewis does, indeed, furnish an exception; but the evidence of Captain Thomas, Dr. Mitchell, Mr. J. F. Campbell, and others (see the *Cran. Brit.*), would lead us to ascribe this to the presence of an aboriginal substratum of population of Finnish type and short stature; and in the district of the Butt, where other Norwegian characteristics break out vividly, the stature is said (though I can give no statistical evidence of the fact) to be decidedly superior to that found in other parts of the Lewis.

* Lubach. The fact is, however, one of common observation.

In Uist, where the Norseman seems to be crossed with the Gaelic Kelt, the men are tall.

I have omitted Northumberland from the foregoing list of Scandinavian districts, in deference to the weighty opinion of Mr. George Tate, and of Mr. Ralph Carr, of Hedgely. Doubtless the Anglian element prevails there; but it is difficult to suppose that the events of the eleventh century can have left Northumberland otherwise than deeply tinctured with the Danish blood of the men of Deira.

The characteristic figure of the Scandinavian race is not so robust as it is often described, but tends rather to be graceful and *élancé*. It may be observed that in Shetland, Cumberland, the East Riding, Nottinghamshire, &c., the average weight is by no means large in proportion to the stature.

In the extensive and important region of the south and east, where Teutonic characteristics, modified by various admixtures, but almost entirely free from anything Scandinavian, may be looked for, our data indicate a good deal of variety; but, on the whole, the stature is comparatively short, and the weight rather high in proportion. Some of the apparent variations may be due to race-differences; *e.g.*, the taller stature in some parts of Kent may have to do with the presence there in large proportion of Jutes and Frisians, who are recognised by Mackintosh and other close observers. The Anglians (more or less crossed) of Northumberland and the Merse are very tall and large men.

Taking into account history, language, and physical characteristics, the so-called Kelts of our islands may be divided as follows:—

1st. The ancient and modern Caledonians. Here there is no difficulty: the same tall, large, and often red-haired people, who occupied the Grampians in Agricola's time, do so in our own time without apparent modification.

2nd. The undoubted Gael in Ireland and the western Highlands, &c. Always, probably, a tall race; generally, as we know them, somewhat bony and spare of flesh, but our returns from Scotland show in general very good weight. This race is currently believed to exhibit great variation under the in-

fluence of media. On this point see, further on, a discussion of the Irish military statistics.

3rd. The remnant of the northern Kymri in the hilly country to the west of Clydesdale, and in Upper Galloway. The same race, but with a stronger cross of the Teutonic (Anglian, or Anglo-Northman) element, seems to extend eastwards along the prolongation of the Cheviots, and to remain in Allendale, in South Northumberland (No. 71.) Its modern characteristics are very tall stature, comparatively moderate weight, with usually light eyes, and dark hair. Of its ancient ones we know nothing, except that very tall men did occur among these people in the days of Llywarch Hên. In Cumberland, Westmoreland, and the south-eastern lowlands of Scotland, it is strong, but is not the prevailing element; and in less proportion is recognisable in many other parts of the north of England (and, according to Lhuyd, of North Wales).

4th. The Welsh, the people who still speak the Kymric language. Of their ancient characteristics we know no more than what is told us by Tacitus of the Silures: among their modern ones are short stature, with good weight, and a tendency to darkness of eyes, hair, and skin. The Devon men are a good deal like them in most respects.

5th. The Cornish. Much like the Welsh, and still liker the Devonians, these differ from both of them by their large stature, which has been a Cornish characteristic since mediæval days, at the least.

At the risk of some repetition, I have been thus particular in discriminating the several existing varieties, or divisions, of the British "Kelt," in order to exhibit the serious difficulties that lie in the way of the application of Broca's theories to the British population. The 3rd, 4th, and 5th divisions just enumerated, have, or have had, the same politics and traditions, and languages nearly related, or separated merely as dialects. Why, then, do they differ so remarkably in stature? If we say that the Cornish are the remains of the Lloegrians, and are not true Kymri, why do not the Devonians rank with them in stature? and why are the Armoricans, who are, or were, nearer in language to the Cornish, liker to the Welsh in their

short, compact build? And if we acknowledge a differenc
race between the Strathclyde Cumbrians and the Wels
Silurian stock, and suppose the former to have the true Ky
the tall race of Edwards and Broca, and to have conquered
latter under the guidance of Cyneddha Wledig, the diffic
still remains that the two had a common language. I ab
from saying that these points are incapable of being cleare
on the theory of permanence of race-type in stature; and s
conjectural explanations suggest themselves to me; but
difficulties are certainly grave.

The inferiority in size of the people of several large tov
especially Sheffield, is obviously inexplicable, unless we
knowledge other modifying agencies than those of race.

Two minor questions fall to be considered in connection v
that of the influence of race on stature. The first is tha
the results of close-breeding and cross-breeding respectiv
the second that of the relation of stature to complexion.

The belief is prevalent that in-breeding has a tendency
cause the breed to dwindle in size as well as in numbers.
the first blush, M. Broca's results obtained in Bretagne conf
this view, the Bretons of the central cantons, where little
mixture of blood has taken place, being far smaller men t
their compatriots in general. But the greater elevatio
stature in some islands and other secluded districts, where
population, while far from being purely Armorican, has
been recently crossed, points to the essential character of
race, rather than its freedom from admixture, as the cause
its remarkably low stature; and such is the opinion of Br
himself.

I am able to quote a series of facts from my Welsh list
prove that the stature of the native Welsh breed is elevated
an English cross. Thus, in No. 181, the men with Engl
names average 1·3 inch (33 millimetres) above those w
Welsh ones; in 164, 185, they surpass the latter by exac
half an inch; in 183, 190, and 191, taken together, by
inch; and in No. 138, together with a report from
Struvé, of Coed Park, which was too late for insertion,
Welshmen, with English surnames, exceeded 41 with We

surnames by no less than 1·8 inch (46 millimetres). In the other returns from Wales no English surnames occur, but in 185 and 186, though the district is now thoroughly Welsh, the ancient Flemish cross may have left its traces in the greater size of the people.

It is possible that here, as in Bretagne, the superiority is inherent in the intrusive or crossing race, and not due to the mere fact of a cross in blood. For the English of Mercia are in general taller than the Welsh, though not very conspicuously so. In the border county of Salop, where about half the surnames seem to be of Welsh type, the English-named men in my lists have the advantage by nearly half an inch, so that the same elevation of stature does not follow on the crossing of the Mercian by the Welsh, as on the crossing of the Welsh by the Mercian stock.

Another side of the same problem may be illustrated from the Scottish returns, wherein the Boyndie and Rathen lists (30 and 32) exhibit the fishermen, very closely inbred communities, as inferior in size to the agricultural population. In 42 and 142, the difference is less strongly marked; in 59, 60, and 197, it is doubtful; and in 66 and 79 does not appear. In 249, the number measured is too small to yield evidence for so large a population as the Brixhamites. 203 is, I believe, a sample of an inbred community of rather small men; but, on the other hand, 88 furnishes a conspicuous counter-example. The researches of Dr. Arthur Mitchell* show, however, that the extent of in-breeding in many districts has been greatly overestimated. On the whole, the results of my tables tend to support, but only in a feeble way, the current opinion as to the advantageous effect of crossing upon size.

The relation of stature to complexion, or rather to hair-colour, has been investigated to an extent greater than its apparent importance might have warranted, in the hope of educing some law respecting the manner and consequences of the interblending of races. The results are by no means conclusive, but are not altogether void of promise. In most parts of Britain, the average stature of fair-haired is higher than that of

* Published in the *Edin. Medical Journal*.

dark-haired men; but in several districts the men who combine light eyes with dark hair carry off the palm: such is the case in Mull, Mar, Kenmore, and Lesmahagow. The only five considerable towns from which I have returns, viz., Bristol, Sheffield, London, Birmingham, and Glasgow, all conform to the rule; and the county of Leicester is the only important exception in the south of Britain, except Harpenden, in Herts, and the Scilly Isles, and perhaps Cornwall.

In the lunatic asylums, the relations of stature to colour are often nearly the same as in the reports from the same population; but where there is any difference between them, it consists almost always in the dark-haired lunatics being taller than their fellows. Such men are, I believe, generally melancholiacs.

It is doubtful whether any valuable conclusions could be drawn from this part of the investigation, unless it were carried out very much further. In the meantime, I am led to form the following hypotheses:—

1st. Individual differences in stature are closely connected with differences in temperament, and more remotely with differences in complexion. Thus, in this country at least, the majority of men of sanguine temperament have light brown hair, of melancholic men dark brown, of men of nervous temperament either fair or black, and so forth.

2nd. Of the several races believed to have taken part in the ancestry of our British population, those most distinguished for tall stature—*e.g.*, the Norsemen and Frisians—were generally fair-haired. It is probable, however, that pre-Saxon races of tall frame inhabited Caledonia (red or black-haired), Cumbria (brown, or dark-haired), and perhaps also Leicestershire and Cornwall.

3rd. In a homogeneous race temperament is the great determiner of stature, and as the divisions of temperament and of complexion intersect each other to some extent, it comes to be little more than a matter of chance whether dark or fair men average higher in a list of moderate number, such as most of mine are.

4th. Where the admixture of races is recent, or the races

have been unconformable, and have never become thoroughly blended, the taller race will continue to be represented, in complexion as well as height, and other physical characters, in the existing population.

For example, I look upon the Shetlanders as an heterogeneous mixture of two incongruous races; one, by far the more numerous, of Norse descent, tall, fair, and, on the whole, of sanguine temperament; the other, either Finnish (descended from the thralls of the Norse settlers) or aboriginal, short, dark-haired, Ugrian in feature, and melancholic in temperament. And in Bristol and the surrounding counties, on both sides of the Severn, I find the fair men generally taller than the dark, and more often presenting in feature and headform an approach to the Saxon and Frisian types. Nearly the same thing may be said of Lincolnshire, Nottinghamshire, and the East Riding, where the Danes furnish the most important light-haired element.

The idea that climate, *per se*, has any influence upon stature is very little supported by our materials. At the first blush, we might be disposed to think that a northern position, and a somewhat rigorous climate, operated favourably, probably by natural selection. But Cornwall furnishes a counter-exception too conspicuous to be disregarded. And the climate of Upper Galloway (No. 54), where the tallest men are found, is, compared with that of Scotland in general, rather mild than severe. Kerry, again, has the mildest climate in Ireland, but its people are physically superior to those of Connaught, the climate of which differs in no wise from that of Kerry, except in being rather colder and less genial. Climate, where it does influence the breed of men, probably does so either through natural selection, or by affecting his food and mode of life.

Differences of elevation, at least such moderate differences as occur in the British Isles, seem to be unimportant. See Nos. 25, 51-2-3, 71, 93, 121, 184-5, which include most of the very elevated districts in Great Britain; and 102, 104-5-6-7, 141, 152, 192, which are the lowest. Corpulence is rare at high levels, however.

Malaria has been recognised in some countries as a potent

cause of physical degeneration; but I am not aware that it ever been shewn to affect the average of stature; and I confident that it does not do so in our latitudes. Thus Zealanders and the Frieslanders are well known to be g rally tall men; and my returns from the fens of the Isle of from the neighbourhood of Boston, and Romney Marsh, p in the same direction.

On the supposed direct influence of soil on its inhabita I have little or nothing to say. Dr. Latham, long ago, poi out to me the possibility of such an influence on the colo tion of eyes and hair; but I have not hitherto been able to it to the test. M. Durand de Gros has lately, in an impor paper on the influence of "milieux" in the Aveyron, clai a higher stature for the natives, human as well as bovine the calcareous districts in that department. My tables do bear fairly on the point. Any influence of this nature wo probably, be exercised through the food and water.

Variations in the quantity and quality of food may plaus be supposed to have considerable influence on the developm of the body; but what is the exact kind of influence exerci may admit of much doubt. M. Broca, if I have rightly app hended his meaning, thinks that scantiness of food, short actual famine and the production of disease, does not prev the growth of the body to the length proposed by nature. remarkable instance in favour of his views is to be found in Upper Nile, where the tribe of the Keks is described by numer travellers as living in a state of chronic starvation, and skelet like emaciation, yet as being of great stature and length limb. There are, however, a number of *reputed* facts that b against this view, and an argument by analogy may be brou against it from a consideration of the variations in size of breeds of cattle and horses, which seem to be related to lc differences in quality of pasture. In this country we are m in the habit of confounding what we call poverty of f with insufficient quantity of the same. If, by the for term, we imply the comparative absence of costly luxuri such as fleshmeat and fermented drinks, there can be no do that such poverty is, *per se*, quite guiltless of any deteriorati

effect on stature and bulk. But positive scantiness and insufficiency of alimentary material is quite another thing, which is, fortunately, not often observed in this country, except in unfavourable seasons, or in the most miserable classes. Edward Smith has shewn cause for believing that the Scotch, the Welsh, and even the Irish, are usually better off, as to quantity of food, than the bulk of English peasants and the lower class of townsfolk, though their food may be less costly, and, in one sense, poorer; and if stature be really affected by chronic insufficiency of food, the only parts of the British Isles where the results are at all likely to appear are, I believe—1st. Some of the southern counties of England, where labour is superabundant and wages are low. 2nd. Connaught. 3rd. Some of the Hebrides. 4th. A few of the largest towns. And, in fact, it is precisely in these four quarters that almost all the instances of very low average stature do really occur. There is one important article of food, in the use or neglect of which great local differences are known to exist—I mean milk. From the great abundance of phosphatic salts contained in milk, it may reasonably be imagined that among ill-fed populations a great deficiency of milk may sometimes be attended with arrest, or lessening, of physical development. The fact that some pastoral and milkeating races, such as the Kirghiz, are known to be of small stature, can hardly be said to militate against this supposition: an excess of the phosphates may be, and probably always is, rejected by the organism, which, however, has no power of supplementing an absolute deficiency. Milk is much more used in Scotland and Ireland than in South Britain; but within the limits of England and Wales, also, the differences are great. The counties in which the use of milk by the peasantry seemed to E. Smith to be large and universal are the following, which I have arranged in the order of quantity used:—Westmoreland, Northumberland, *North* Lancashire, Wales (but especially North Wales), Yorkshire, Cornwall, Devon, Notts, Worcestershire, and Cheshire; Derbyshire, Northamptonshire, and Leicestershire, stand next below.

Of all this list, Wales and Devon are the only two provinces

in which the stature is below the English average; and in these two it is probable that the influence of race is perceptible: moreover, in some parts of Devon, the wages are notoriously low, and food of other kinds probably rather scanty. The exceptional position of Cornwall favours the theory of the importance of a constant and plentiful supply of food for the full development of stature; for the abundant supply of fish, the seafaring opportunities of the long and indented line of coast, and the wide diffusion and prosperity of mining industry, must for generations past have put the labouring classes of Cornwall, on the whole, in a better and more secure position than those of Devon and Wales, where these advantages have been enjoyed to a far smaller extent.

I have particularly investigated the nature of the customary diet in some of the districts where the greatest development in size seems to be attained; such are Nos. 54, 57-58, and 88, in all of which meal and milk form, or did lately form, the staple food of the people. On the other hand, in large towns, where I shall presently show that stature tends to decline, white bread is eaten; the supply of milk, and even the demand for it, is small; and the people are worse off in this respect than others, except those of some dairy districts in the south of England.

The apparent influence of certain occupations on the stature of those who exercise them, has already been partially discussed in connexion with the English military returns, and will come again under notice when we consider the results of massing people together in large towns; but, in the meantime, the private returns relating to miners may, perhaps, yield some noticeable facts. Nos. 52, 53, 71, 89, 184, 250, 251, 252, and, to a great extent, 254 and 255, consist of lead and tin miners; Nos. 76, 188, 214, 215, and 223 bis, of coal miners. Dr. Greenhow, in his medical reports to the Privy Council, has shewn that there exists a great difference between these two classes in their liability to pulmonary disease, the lead and tin-miners suffering severely from asthma and consumption, or diseases so called, and being supposed to transmit a hereditary susceptibility to *their* children. They are not otherwise, however, an unhealthy

set of men, and the causes which bring about this particular kind of mischief do not seem to operate unfavourably on the development of the body, for the average stature among them rules high, and, in some instances, as near Tavistock and Fowey, seems to surpass that of the general population. Colliers, on the other hand, are often short men. It is true that short but strongly-made men must be better adapted for the work of excavating thin seams of coal than taller men; and, therefore, some process of unconscious selection may account for the tendency, which is most pronounced in No. 223 bis, to the production of a breed exhibiting short stature combined with heavy weight.

The differences between the upper and lower classes are considerable, and may be traced with probability to several causes, viz., 1st. Selection, natural or conjugal, the latter very little operative in the present state of society. Somehow, the Scandinavian type tends to prevail among the aristocracy; and the Saxon among the trading class, whether through natural aptitude or the effect of media. 2nd. Greater advantages in food and air during childhood and youth; and 3rd, and perhaps most important, freedom from overwork during the same period. It may be noted here that the observations of Professor Forbes at Edinburgh, and those taken at Cambridge, and sent by Dr. Whewell to M. Quetelet, referred to students of the upper class, and not fully grown, and therefore in neither respect average representatives of the British people, as they are sometimes assumed to have been. Erroneous inferences as to national differences have also been drawn from the superiority of Forbes's Irishmen to his Scotchmen and Englishmen, in height and strength, the fact being that the Irish-born students in Edinburgh are generally descendants of the Ulster colonists, more Scotch than English, and more English than Irish in blood.

The extent to which the upper classes surpass the lower in stature varies very much in different districts: so far as I can judge it is least, as a rule, in those where the general average is highest; and this is what might be expected, as the differences in mode of life, and even in blood, lessen as we ascend

the social scale. A good specimen may be found in the return of Bristol Volunteer Riflemen, No. 223, and another in No. 220. It will be observed, also, that wherever I have stated that the middle-class element is large in any private return, the average is almost invariably rather high.

Farmers and farm-labourers — two classes differentiated chiefly by the accidents of social position—are mingled in a large number of returns; and in some instances I have separated the former; *e.g.*, in Nos. 51, 54, 69, 88, and 228. They enjoy, as a class, almost all possible advantages for physical development (including hereditary endowments, for they may almost be said to form a caste), and accordingly we find that their average size almost always rules high. 233 is a notable example of this, inasmuch as the labouring classes of West Somerset, who are by no means highly paid or highly fed, are shewn by several other returns to be generally of small stature. The averages of agricultural labourers vary greatly, and in such a way as to lead one to suppose that they are influenced both by selection and by *media*. Thus, in the Merse and in Flegg (57 and 141), the labourers about equal the farmers in stature: in the former, as in Galloway (54), and many other northern districts, they have the advantage of not being constantly overworked in early life, the Scotch peasant valuing education too much willingly to deprive his children of its advantages. In Lincolnshire, the agricultural labourers seem to fall below the rather high standard of the rest of the population; whether this fact may be at all connected with the formidable proportions assumed in this generation by the pernicious system of agricultural child-gangs, I am unable to say. In the counties round London, again (and especially in 159 and 161), the farm-labourers are an undersized class. This I believe to depend partly on the great demand in the metropolis for tall and well grown men, for policemen, railway porters, &c., which makes it so easy for such to better their condition, that the residuum of farm labourers may be considered to be a sort of *caput mortuum*. I am disposed to think that, in some instances (*e.g.*, 165), the inferior development of the labourers may be traced to the fact of their ancestors having degenerated

under the influence of manufactures formerly existing in the district; but I am not able to make out a case in support of this view, and mention it merely as interesting, and capable of investigation. In South Gloucestershire, 35 farm-labourers yield a net average of 5-6·3 and 156 (1·684 met., and 70·75 kilos.), and this heavy weight runs through all the returns from which the list is compiled, and appears to be characteristic of the breed of men thereabouts, which differs manifestly from the neighbouring Somerset peasantry.

The physical differences between countryfolk and townsfolk are, perhaps, the most important ones developed in my tables. To the indications of degeneracy in the latter, the attention of the Social Science Association was called in two papers of my own,* and subsequently in one by Dr. Morgan, of Manchester; but the statistical evidence which I can now adduce converts conjecture on this subject into certainty. Compare, for example, Nos. 46 and 47 with any of the Scottish rural returns, or even with 48. Again, in 70, observe the gradual elevation of stature of the militia-men, as we proceed from natives of Newcastle to those of Gateshead and the other suburbs, and then to those of the small towns and villages. It would be unfair to bring into strict comparison the gigantic rural volunteers in the preceding Northumbrian returns; yet it may be remarked that the latter are for the most part only artisans and labourers, and that social superiority will certainly account but partially for the contrast. Next observe the Sheffield return (No. 95); the genuine natives of that town will be seen to fall considerably short of their fellow-workmen born in the surrounding towns and villages, and these again very much below the general population of Yorkshire and the other adjacent counties (78, 92, 101, 111, 117, 118, 121). At Haworth (93, 94, 99), the population of weavers is stunted in comparison with Yorkshiremen in general, but even among them the natives of towns fall below the natives of villages, so that the degradation of stature would appear to be gradual and progressive. The Lancashire and Norfolk returns are insufficient,

* *Trans.* Social Science Association, 1857, 1861.

the Nottinghamshire and Staffordshire fuller and more decided, but all point in the same direction. In those from Birmingham and Shrewsbury there is less difference; but the inferiority of the Bristol, Bath, and Exeter men (220, 223, 224, 247),* to their neighbours is pretty well marked. Finally, the London return (163), which certainly does not err by depreciation, is much below the average of England; and the remarkable one from Spitalfields exhibits a standard far inferior even to that of the kindred of these poor weavers, who dwell in the south midland regions of France.†

The lunatic, criminal, and military returns generally support the private ones; and in the case of the metropolis (308, 341, 352) their unanimity is very striking.

It may therefore be taken as *proved* that the stature of man in the large towns of Britain is lowered considerably below the standard of the nation, and as *probable* that such degradation is hereditary and progressive. And we must put aside, as unfortunately not applicable to ourselves, the observations of MM. Quetelet and Villermé, who found the inhabitants of Brussels and certain other towns, at the age of 19, slightly superior in stature to those of the surrounding country. This last fact may be accounted for, partly by the probability that as puberty arrives later in the country, so the full growth is not so quickly attained; partly also by the collection into the towns of Belgium and France of the majority of the upper, well-fed and comfortable classes, and by the inferior advantages enjoyed there by the rural population.

What are the causes which determine these variations of stature, which I have shown to exist in townmen and artisans? There are several which do, or may, or have been supposed to contribute to the result, but I think they may all be arranged under the following heads:—

1. Birth and rearing in town or country ... { A. Influences prior to birth. B. „ subsequent thereto.

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* Compare also 221, 222.

† Stature rules low in the Cevennes, but yet above that of my Spitalfields people.

2. Selection and elimination .... { c. Natural or spontaneous. d. Artificial.
3. Nature of employment.
4. Habits of life during youth.

1. Most of the workers in the smaller or more specialised trades are town-born; for these trades are usually exercised in towns only, and it is much easier for lads who are on the spot to gain admission to them. Thus, I have found in Bristol that almost all the potters, ropemakers, cabinet-makers, bookbinders, etc., are townsmen, natives of Bristol, or other considerable towns. This does not apply so much to tailors and shoemakers; for their arts, like those of the carpenter, mason and smith, are needed, and therefore exercised, everywhere to some extent.

A. Under this head comes the influence of race. In Bristol, for example, there is a great deal of Welsh; in London and perhaps in Norwich, of French blood; and the Irish element is beginning to leaven the town population everywhere to a slight extent. Here may also be mentioned the greater facilities which feeble and physically degenerate persons find in towns for contracting matrimony, and reproducing their defects and infirmities in another generation. There may be other hereditary influences apart from race and from disease, and the classes of grooms and miners are among the most likely to be affected in this way. Other possible influences prior to birth are those derivable from habitual drunkenness, or from phthisical or syphilitic disease in the parents; or from insufficient feeding of the pregnant mother, or from too early marriage; but only the third of these can be positively affirmed to have any effect on the development of the body as to size. All of them are probably more frequent in town than in country.

B. Hereunder are included various errors in the mode of bringing up children; the effects of close and impure air on children, and of insufficient or unwholesome feeding. The more frequent deficiency of breast-milk in the mothers in towns is a great cause of high mortality and slow development, and may possibly influence the subsequent growth of the offspring; and the want of a supply of good cow's milk,

and, indeed, of a demand for it among the lower classes, is of very serious importance, and unhappily affects the inhabitants of certain pastoral districts in England to a greater extent than even those of large towns.

2 C. By natural or spontaneous selection I mean the kind of influences that send to the sea the lad who has an adventurous disposition (with which generally concurs a compact and well-developed frame), or who lives on the sea coast. This subject borders on that of hereditary influence. I have elsewhere spoken of the *possible* effect of conjugal selection in modifying the type of a race.—(*Anthrop. Review*, i, 310. On the supposed increasing prevalence of Dark Hair in England). In certain states of society conjugal selection, either spontaneous or according to rule, operates towards maintaining the beauty and vigour of the race. Under our present circumstances it is very doubtful whether it continues to do so. Physical qualities have no longer the value they used to have in the matrimonial market; but I do not know that this applies specially to any particular classes of the population.

By natural elimination I mean, for example, the effect produced in a trade in which phthisis is very rife (such as that of the tailor), by the early death or withdrawal of those hereditarily or otherwise predisposed, who have often a peculiar bodily type.* Some of the agencies mentioned under 1 B, 3 and 4, may probably affect the physical type of succeeding generations of townsmen chiefly in this kind of way.

D. The effect of artificial selection is more generally recognised, and, as I think, even overrated. It is true, however, that a small active lad is often chosen to be a jockey or groom, a weakly one to be a tailor or bookbinder, a tall strong one to be a porter.

3. Influences from the nature of employments are numerous and various; we are concerned here only with those which

* Tall youths are certainly, on the whole, *cæteris paribus*, more liable than others to phthisis; but it is not at all clear that this applies to adults. Dr. Hill of Lymington found the average height (with shoes) of thirty phthisical adults in Brompton Hospital, to be 5 ft. 7·2 inches. They were from all parts of England.

affect the development of the body in size or weight, which are not necessarily or always identical with those which conspicuously shorten the duration of life. Thus, butchers and stonemasons are on the average rather short-lived, owing to causes which need not here be specified; but both are placed under conditions favourable to bodily development during the years from fifteen to twenty-five, when growth is being completed. The agencies which are really powerful are probably foul close air (as in tailors), cramped position (as in shoemakers), small wages yielding insufficient food (more likely to delay than to stop development), and long hours with insufficient sleep.

4. The early and copious use of alcohol and tobacco have the reputation, probably well-earned, of stopping growth; and are notably more rife in some trades than in others. The want of opportunity and stimulus for the development of their physical powers by young persons in towns, the earlier occurrence of puberty, itself an effect of complex causes, and the greater frequency of youthful profligacy, may all be noted here.

Such are the numerous possible causes of the comparative lowness of stature in particular classes. Do the tables in the present paper throw any light on their relative importance? They appear to me to do so. But, perhaps, the indications of the tables may be rendered clearer by the following epitome of the military ones.

TABLE VIII.

	A. Favourable Class. (Iron, Wood, Masons, Labourers, and Miscellaneous Outdoor.			B. Unfavourable Class. Tailors, Shoemakers, and Miscellaneous Indoor.		
	No.	Stature.		No.	Stature.	
		Ft.	In.		Ft.	In.
Scotland	307	5	7·49	141	5	7·03
Sussex & Kent Groups .	572	5	7·07	99	5	6·92
Staffordshire Group .	155	5	7·23	62	5	6·87
Lancashire and York .	316	5	7·01	106	5	6·67
London	165	5	6·90	100	5	6·42

Neglecting for the present the Scottish recruits, we have here, in class B, a regular decline as we proceed from the rural to the metropolitan district, and probably we should have the same in A, but for the interference of the element of race in the Staffordshire group; as it is there is a general, but mode-

rate and irregular, decline in A. Thus is exhibited the unfavourable action of those causes which may be compendiously described as those affecting the town-born more than the rural population. On the other hand, the action of the causes connected with the employment itself is brought out conspicuously by the facts that in every territorial division class B stands below class A, and that in the metropolis, contrary to what might perhaps have been expected, the difference is greater than anywhere else.* It would seem, in fact, that the influence of town-birth is greatest in class B, and that the influence of unfavourable occupation is greatest in the towns; that while each class of agencies has a moderate deteriorating influence while at work separately, its effect is very greatly increased when it co-operates with the other. These results agree very satisfactorily with those I have obtained from personal observation in Bristol and elsewhere, and from the reports of my correspondents. Thus 30 natives of Bristol, employed by Messrs. Derham Brothers as rivet-shoemakers, yielded an average stature and weight of 5 ft. 4.90 in.† and 125.67 lbs., while the same number of men born in the county of Somerset, and employed in the same place and manner by the same firm, yielded averages of 5 ft. 6·74 in. and 134·0 lbs. And Mr. P. J. Worsley found that of the men employed in the Netham Chemical Works, 15 natives of Bristol averaged only 5 ft. 5·76 in. and 135·70 lbs., and 30 of the suburban parish of St. George's 5 ft. 6·24 in. and 138·13 lbs., while 27 from the rural parishes of Bitton and Hanham rose to 5 ft. 8·0 in. and 145·16 lbs. So much for the influence of birth; that of occupation seems to come out best in the details of the Sheffield and Bristol returns (96 and 220). Pending further investigations, I am disposed to think that the facts are best explained by the theory of a hereditary and progressive physical degeneration in certain classes of the inhabitants of towns. But, be this as it may, there can hardly, I think, be any ques-

* There is a wider opportunity for selection in towns than in the country, and men more often, probably, enter those trades for which they are bodily qualified.

† The following figures include shoes and clothes.

tion of the great national importance of the whole subject, at a time when the British people is rapidly being transformed from an agricultural into a manufacturing, from a rural into a civic people; when, with an increasingly-felt necessity for keeping up our military power, we have an increasing difficulty in obtaining recruits; and when the truth that both the individual and the national body require physical as well as mental and moral cultivation and development, is becoming more and more distinctly acknowledged. Thews and sinews may not be so universally and pre-eminently valuable among civilised as among uncultivated peoples; but in all ages, since the English became a nation, their position among other nations has been in a great measure due to the frequency among them of individuals of great strength and physical energy; and when we as a nation fall below others in this respect we shall suffer for it not merely in our military but in our commercial, and even in our scientific position.

I do not wish it to be supposed that I place a high value on superiority of stature as an individual advantage, or that I ignore the disadvantages that often attend it. I allow, too, that in nations, as in individuals, the greatest amount of physical vigour and hardihood by no means always accompanies the greatest size and stature. But if we examine only a single race or reputed race at a time, we shall find, I believe, that wherever that race attains its maximum of physical development it rises highest in energy and moral vigour. Thus the inhabitant of Oude or the Punjab is as superior in courage and energy to the puny Bengali as he is in bodily conformation. And, to come nearer home, I have shown that Scotland in general, Northumberland, Cumberland, parts of Yorkshire, etc., and Cornwall are the portions of Great Britain which produce the finest and largest men. I think it will be acknowledged that they also yield more than their share of ability and energy for the national benefit.

APPENDIX.

THE STATURE AND BULK OF THE IRISH.

For this I have to rely mainly on the military returns :—

The whole number of men they contain is 1517, a number sufficient, probably, for the determination of the average stature of the classes that yield recruits, but too few, unfortunately, for some of my more important objects.

I will first endeavour to determine the average stature of these classes in Ireland and in the several provinces, and will state the averages of weight and chest girth. Next, I will compare the Irish with the English, Scotch, and Welsh, and, in the last place, will attempt to investigate the relations of stature to race in the several provinces.

It is the peasantry, the artisans and handicraftsmen, and, above all the non-agricultural or general labourers, that fill the ranks. Of the classes that furnish very few recruits some, as the gentry, professional men, and farmers, are generally rather above the average of physique; others, as sailors and factory operatives, fall below it in stature or bulk, or in both. These exceptional classes are less numerous in Ireland than in England; and, owing to this fact, and to the higher rates of wages in some parts of the latter country, I think the recruiting returns there a less trustworthy guide to the subject in hand. Probably the Irish recruits almost equal in stature and fall somewhat below in weight, the average of that part of the general population which exceeds 5 ft. 5 in. in height.

The means yielded by the figures in the books are 5 ft. 7.25 in. and 138.03 lbs. The weights thus given admit of little correction, but the statures admit of and require much. Some of the examining officers take no note of fractions of inches; with them every man ranging from a little below 5 ft. 8 in. to a little below 5 ft. 9 in. is set down at 5 ft. 8 in.; and even those who measure to a quarter of an inch must in most cases allow a small surplus of height, averaging probably about 1-10th of an inch, unaccounted for. If we allow 0·15 in. and 47 lbs. for the unregistered surplusages we shall have 57·40 (1·712 metre) and 138·00 lbs. (62·8 kilog.) for the exact

average height and weight of a full-grown Irish recruit. The average girth of the chest is 34·73 in., but on this point it is impossible to compare the observations of different observers together with any confidence.

In all the provinces, but most of all in Connaught, a considerable portion of the population must fall below the standard height of 5 ft. 5 in. The average stature of the entire population, including these short men, may, however, be estimated, or at least conjectured, from the culminating points of the curves formed by the numbers at each inch in the scale, or between every two inches in the scale. In this way I arrive at the following means: for Dublin, about 5 ft. 6·4 in.; for Ulster, Munster, and remainder of Leinster, about 5 ft. 6·8 in. or 5 ft. 6·9 in. (1·697 metre); for Connaught, probably as low as 5 ft. 5·5 in.; while the labourers of Leinster birth, taken separately from the artisans and others, rise to 5 ft. 7·3 in. or thereabout, and the agricultural labourers of Ulster and Munster are probably equally tall. For all Ireland the mean would be 5 ft. 6·5 in., or a trifle more. Some data supplied by Dr. Graham Balfour in the Army Medical Reports, lead me to think this rather under than over the mark. See also Nos. 258, 259, 322, 326, 348, 351, in my own tables; 84 Irish reapers from Connaught and Ulster averaged 5 ft. 6·27 in. and 146 lbs. (in Johnston's *Physical Atlas*), but it is not stated whether shoes were included; they were mostly from counties where the stature appears from my tables to be inferior.

I have already stated that I think the English and Scotch recruiting returns less trustworthy as indicators of the average stature than the Irish ones. Still I have thought it worth while to compare them together. The Scotch recruits are about equal to those of Leinster and Munster in stature and weight, and superior in both respects to the Irish, taken collectively, and they clearly exceed in girth of chest both English and Irish, though the Welsh may equal them in this point. The Welsh recruits weigh heaviest, but their stature is considerably lower than that of the Irish. The English vary very much; some agricultural counties yield large men; but on the whole they do not quite equal even the Welsh in stature or the Irish in weight; and this seems to be mainly due to the low average of the recruits from the metropolis and from manufacturing districts, and to the short stature (perhaps a race character) prevailing in the south-eastern or Saxon part of England. At Bristol the Munster men inspected compare pretty favourably with those from the neighbouring districts, to whom they are decidedly superior in girth of chest; and at Liver-

pool the Irish have the advantage in all three respects of the native Lancashire recruits.

In comparing the natives of the several provinces of Ireland, I have separated the men described as labourers from those attributed to all other occupations. This distinction would have been of more use if farm labourers and peasants had been set apart from ordinary town labourers, who are to a great extent a different class; but this has been done in the Cork and Belfast reports only. I have also, with a view to testing the connection between variations of race and of stature, placed on one side all the names of purely Irish origin, such as O'Shaughnessy, Sullivan, etc., together with a few such as Hart, King, Fox, and Harrington, which are known to have been adopted from the English by Irish septs, or to be translations of genuine Erse surnames. A few of mixed Scandinavian and Celtic origin, as Cottar and MacAuliff, have been included. On the other side, I have placed all the Anglo-Norman and Early English introductions, such as Fitzgerald, Burke, Joyce, and all the later ones, whether English, Welsh, Scotch, Huguenot, or Palatine, including here, not without some doubt, names from the Scotch highlands, where these can be distinguished from those of the genuine sons of Ulad.

The percentage of exotic or un-Irish names among the recruits appears to be as large as 42¾ per cent., and to vary from 62½ in the three north-eastern counties to 28½ in Connaught. The diversity between counties is even greater, but the numbers for most of the counties are too small to be of value. In Leinster the distribution of the two classes seems tolerably even, while in Ulster the foreign names decrease pretty regularly as one proceeds westward; in Munster, Tipperary and Limerick abound with foreign names; and in Connaught, Sligo and Mayo exceed the average of the province.

Whether these percentages represent with anything approaching to accuracy the proportion of the foreign blood in Ireland may, of course, very well be doubted. The most remote counties, which yield the smallest proportion of exotic names (*e.g.*, Kerry, Clare, Donegal) yield also very few recruits. My own observations go to show that while the great majority of the landed and professional classes bear names of English or Scotch origin, the preponderance of native names among the lower classes of all parts of the country, except, perhaps, Forth and Bargy, in county Wexford, is far greater than my table indicates. It is highly probable, and consists with what we know of the corresponding races in France, Scotland and Wales, that the invading race, so far as it has

remained in any degree separate, being more adventurous and less bound by family ties, may be much more disposed to enlist. The mixture of blood is probably nowhere complete, even where differences of religion have not interposed; and the fact that in every province, and in almost all the counties, the proportion of labourers to artisans, etc., is greater among the native names may be taken as a proof of this. I am disposed to think that the proportion of so-called Danish blood in Ireland is usually under-estimated; the Anglo-Norman sack and massacre of Waterford, for instance, could not have obliterated a tribe that had thriven there for hundreds of years; and I recognise the Scandivanian features and complexion in a large proportion of the people about the Waterford and Wexford estuaries. But setting the Danes aside, and beginning from the Anglo-Norman invasion, it seems probable that the assumption of English names by the Irish, and the comparative paucity of women among the invaders and colonists, must have more than made up for antagonising influences, and rendered Irish names less prevalent than Irish blood.

I have already remarked that the numbers belonging to single counties are too small to be at all trusted as data for averages. The great discrepancy between Kilkenny and Carlow, two counties which in most respects greatly resemble each other, is an illustration of the fact. It can hardly, however, be the result of accident that ten out of the thirteen counties whose recruits fall below the mean of Ireland lie together in a ring fence, as it were, extending from Dublin Bay to the Atlantic, nor yet that the figures belonging to Dublin and Connaught, in Table I, fall in every case below the average of stature.

Can these facts be best explained by allowing that in Ireland, as in France, the average stature varies with the race, and not with the influences (of climate, food, etc.), to which the race is subjected? Or do they rather point to the influence of unfavourable "media" in causing degeneration? We will begin with the former supposition. I do not believe the Gaelic Irish to have been homogeneous; but not even Sir William Wilde, nor yet any one of those four able labourers in the ancient Irish field, who have all left it and us so lately—not Petrie, O'Donovan, O'Curry, nor Windele—could give us reliable grounds for a local division of their several tribes. Taken altogether, they evidently were and are, at all events under favourable media, a tall race. (Compare O'Donovan's Paper, Froissart's informer, Dr. Davis's measurements from Kerry in the *Crania Britannica*, and the figures for Kerry and Donegal in the present paper). Whatever an importation of

old Norsemen and modern Scotchmen may have done, one of modern southern English and Welsh is more likely to have lowered the standard than to have raised it. But if so, why are the people of southern Leinster as tall or taller than the Munster men, and these latter so much taller than the Connaughters? Even the Danes will hardly serve to confront this difficulty. In Connaught the people with exotic names are the shorter, as they ought to be on this theory, but on the other hand in Leinster and Munster the proportions vary, and are on the whole adverse to it. The theory of permanence might to some extent be helped out by supposing the existence in some districts, *e.g.*, in Connemara and Northern Roscommon, of a small, dark-haired, and often dark-eyed race (possibly the true Firbolgs), left as islands by the flow of the tide of large-boned, long-headed, hard-featured, grey-eyed, dark-brown-haired men, who yield the common type of the Irish Kelt. If so, the people in County Cavan, whom Wilde describes as rounder-headed and fairer than other Kelts, may possibly be relics of the Danaans, and not, as I used to believe, mere Saxon *parvenus*. But if all this must be summarily dismissed as far-fetched, let us see what can be made of the popular solution of the matter, the theory that the Connaughters had degenerated under the influence of semi-starvation, until their kinsmen across the Shannon would no longer acknowledge the connection. This view was brought forward years ago by a writer in the *Dublin University Magazine*, and so forcible and graphic was the picture he drew of the dwarfish, pot-bellied, abortively-featured, prognathous "spectres of a people once able-bodied and comely" that haunted Sligo and Mayo, that it has been quoted by every monogenist writer at home and abroad ever since. The passage is entirely a libel on the natives of eastern Sligo; but as I never visited Mayo I am not prepared to deny that it may be more applicable there. It does not apply to Connemara, where the people, though small, are well-built and well-favoured, nor to Joyce's and O'Flaherty's country, near Galway, where they are notoriously tall.

The evident, though moderate, degeneration of stature in Dublin, where the race elements are pretty well known, does, however, incline me to think that the same thing may have really gone on in Mayo to a greater extent. If so, its occurrence, and the fact that it appears to have been greatest in the people with exotic names (if we may trust to so small a number), may possibly be explained in the following manner. It is evident that a large number of the landholders and townsmen in

the three other provinces, with their families and dependents, were "transplanted" into Connaught at the time of the Cromwellian Settlement. Probably most of these may have subsequently returned: but the ultimate result can hardly have been anything else than that the more helpless remained in little communities, to a great extent of English blood, in an ungenial climate and among a half-alien people, until they sank into a lower condition than those natives themselves, and were finally absorbed by them.

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